ANDHRA PRADESH SOLAR POWER CORPORATION Pvt. Ltd
(A J V COMPANY OF GOVT OF ANDHRA PRADESH AND GOVT OF INDIA)

TADEPALLE: GUNTUR DISTRICT

NOTICE INVITING TENDERS (NIT) NO.

APSPCL-e-E-27/2022-23/EE/Tech/APSPCL, Dt.26.05.2022

For

Augmentation of 220/33kV Pooling Substation-2: Supply, Erection including civil works, Testing and Commissioning of 2 Nos. 220/33kV Power Transformers Bays at Galiveedu site of Ananthapuramu Ultra Mega Solar Park (1500 MW). A.P.

TENDER SPECIFICATION

Executive Engineer/Tech
4th Floor, Garuda Enclave APSPCL,
Tadepalli, Guntur District - 522 501
Ph: - 08645-274040/41/42

SECTION-I

ANDHRA PRADESH SOLAR POWER CORPORATION PVT. LTD.

TENDER NOTICE

APSPCL-e-E-27/2022-23/EE/ Tech./APSPCL, Dt.26.05.2022

1.	Department Name	Andhra Pradesh Solar Power Corporation Pvt Limited (**A J V Company Of Govt. Of Andhra Pradesh And Govt. Of India**)
2.	Circle/Division Name	Executive Engineer/Tech /APSPCL/Tadepalli, Guntur District
3.	Tender Notice No.	**APSPCL-e-E-27/2022-23/EE/ Tech./APSPCL, Dt.26.05.2022**
4.	Name of Work	Augmentation of 220/33kV Pooling Substation-2: Supply, Erection including civil works, Testing and Commissioning of 2 Nos. 220/33kV Power Transformers Bays at Galiveedu site of Ananthapuramu Ultra Mega Solar Park (1500 MW).A.P.
5.	Estimated Contract Value	**Rs.**5,49,40,671/- (Rupees Five Crores Forty Nine Lakhs Forty Thousand Six Hundred and Seventy One Only) **Excluding Taxes & Duties.**
6.	Period of Contract	Eight (8) months
7.	Performance Guarantee:	24 months from date of completion of the work/ Commissioning of the project
8.	Form of Contract	Turnkey
9.	Tender Type	Open Tender (e-platform)
10.	Tender Category	Work
11	Transaction Fee Payable to MD/ APTS payable at Vijayawada (including GST)	Rs.11,800/- (Rupees Eleven Thousand and Eight Hundred Only)
12.	Bid Security (EMD)	Rs. 5,49,407/- @ 1% of the ECV (Rupees Five Lakhs Forty Nine Thousand Four Hundred and Seven Only)
13.	Bid Security Payable to	By way of online payment through e-procurement portal
14.	Process Fee	Not Applicable
15.	Schedule Available Date & Time	26.05.2022, 5:00 PM
16.	Schedule Closing Date &Time	23.06.2022, 4:00 PM
17.	Bid Submission closing Date & time	23.06.2022, 5:00 PM
18.	Pre-Bid Meeting:	No Pre-bid Meeting (Online queries) – Visit the site before Quoting the tender.
19.	Bid Submission	Online

20.	Bid Validity	180 days from the date of opening of Price bids.
21.	PQB or technical bid opening date	24.06.2022, 3:00 PM
22.	Price Bid & Reverse Tender Opening Date & Time	27.06.2022, 11:00 PM (On wards)
23	Eligibility Criteria	1) The bidder should have valid 'A" Grade electrical license issued / recognized by **the Government for** executing the electrical works related to Extra High voltages. 2) The firm should have valid registration from registrar of firms or register of companies. 3) Experience: The bidder should have executed at least the following works in the last 10 years as a prime contractor / as a lead partner for qualifying the notified work. a) Supply, erection, testing and commissioning of 2 no's 220 kV bays or 1. No .132 KV Substation to any Govt. Power utility/ PSU in India. b) The above works shall be Successful operation for at least one year. The bidder shall enclose the proof of successful operation of 1 year.
		Note: -1. The bidder has to enclose the 'Manufacture Authorization Certificate 'as per profarmA enclosed as Annexure.
		4. Solvency: **Liquid asset/credit facilities/Solvency certificate** (not older than 12 months from the date of availability of tender specification on e-procurement platform) issued by any Indian Nationalized Bank or scheduled bank of value not less than 50% of estimated contract value
		5. Turnover: The bidder should have aggregate turnover of 3 times of estimated contract value during last three preceding financial years put together i.e., from FY 2018-19 to FY 2020-21. The bidder shall submit annual turnover certificate duly certified by Chartered Accountant (CA).)
24.	Place of Opening of Tenders	In the chambers of Executive Engineer/Tech/ APSPCL, Tadepalli, Guntur District -522 501
25.	Officer Inviting Bids	Executive Engineer/Tech/ APSPCL, Tadepalli, Guntur District, A.P. – 522 501,
26.	Address & Contact details (E-mail id, Phone, Fax)	Executive Engineer/Tech/APSPCL, Flat No. 401, 4th Floor, Garuda Enclave, Beside T.G. Plaza, Tadepalli, Guntur District, A.P. – 522 501. E-Mail:apspcl@ap.gov.in , md.apspcl@ap.gov.in
27.	Procedure for bid submission	Procedure for Submission of Bids: - a) The Bids should be in the prescribed form, which can be obtained from e-procurement platform from the date of electronic

		publication up to the time and date indicated in the Bid notice. The intending bidders would be required to enroll themselves on the e-procurement market place tender.apeprocurement.gov.in. Those contractors who register themselves in the e-procurement market place can download the Bid schedules free of cost. The bidder shall authenticate the bid with his digital certificate for submitting the bid electronically on e-procurement platform and the bids not authenticated by digital certificate of the bidder will not be accepted on the e-procurement platform following the G.O.Ms.No.6, I.T&C Department, dated. 28-2-2005. For enrollment and Registration APTS, Vijayawada is to be contacted. b) Intending bidders can contact office of the Executive Engineer/ Technical/APSPCL/ Tadepalli, Guntur District –522 501 for any clarification / information on any working day during working hours. c) The bidders who are desirous of participating in e-procurement shall submit their technical bid, price bid etc. in the standard formats prescribed in the Bid documents, displayed at e-market place. The bidders should invariably upload the statement showing the list of documents etc., uploaded in the e-market place in support of their technical bid. The bidder should load scanned copies of all the certificates, documents etc as called for here under. The bidder shall upload all the statements, documents, certificates duly signed by him, owning responsibility for their correctness / authenticity. d) Technical bid evaluation of the bidders would be done on the certificates/ documents furnished by the bidder against qualification criteria. a) The bidders shall invariably upload the receipt of online money transfer through RTGS/NEFT. The successful bidder shall furnish the original of the same either personally or through courier or by post within the stipulated time specified by the purchaser The bidder shall invariably upload the following i) Documentary evidence to establish the quantity supplied so far such as invoices, DCs, GST documents ii) Performance reports to meet the QR-performance iii) Documents in respect of financial turnover of last 3 years. iv) Type test reports v) Guaranteed technical Particulars, drawings etc The bidder shall furnish the declaration that: i) They have not been black listed in any department in A.P. due to any reasons. ii) They will agree to get disqualified themselves for any wrong declaration in respect of the above and get their Bid summarily

		rejected. iii) The soft copies uploaded by them are genuine. Any incorrectness/deviations noticed will be viewed seriously and apart from canceling the work duly forfeiting the Bid security, criminal action will be initiated including suspension of business and/ or black listing.
28	Procedure for Online Reverse Auction	**1. Reverse Tendering Process:** The following reverse tendering procedure will be followed as per G.O.MS.No: 67, WR(Reforms), Dept., Dt: 16.08.2019. a) All bidders shall self-declare their details under each technical and financial criterion on the e-procurement platform along with an undertaking confirming their compliance with the technical and financial criterion prescribed in the bid document and upload the same in the e-procurement website. b) All bidders shall submit supporting documents for their submittals under each technical and financial criterion. In case of documents found to be defective, incorrect or forged and therefore claim of qualification is not supported, severe action including forfeiture of EMD shall be taken. c) The Price bids of the qualified bidders shall be opened and the lowest quoted price bid among the qualified bidders in the tender process shall be determined. d) **To conduct the reverse tender process at least two bidders would be required**. e) If the number of bidders participated in initial tendering are more than five (05), 60% of the bidders participated in initial tendering (counting from the bidder who has quoted lowest initial price offer) or five (05) whichever is more will be allowed for reverse tendering. If the number of bidders participated are equal or less than five (05), all bidders will be allowed to participate in the reverse tendering. f) The L1 Price Offer (Initial) shall be the maximum allowable Bid price for the reverse tendering process. **g)** Only one round of reverse tendering shall be carried out in which bidders can revise their bids multiple times within the time **limits specified.** h) At the start of the Reverse Tendering process the Maximum Allowable Bid Price will be set and bidders shall submit their bids in an online platform. i) Names of the bidders / vendors shall be anonymously masked in

		the Reverse Tendering process and vendors will be given suitable dummy names. j) The initial period of the Reverse tendering process will start after 3 hours, following which there will be auto extensions of time by 15 minutes in case of any reduction in bids recorded in the prior 15 minutes. k) Only the current L1 bid shall be visible to all bidders who may revise their bids until the end of the process. l) Decrements made in each subsequent bid shall not be less than 0.5% of the IBM/ECV uploaded. m) The L1 bid may be determined following a period of inactivity of more than 15 minutes of reverse bidding after the initial 3-hour period after closure of the main bidding. n) Following the determination of the L1 bid, the L1 bidder's supporting documents under each technical and commercial criterion shall be verified. The reverse tendering process shall be on hold for a maximum period of 24 hours (1 day) while the L1 bidder's supporting documents are verified. o) Upon successful verification of the L1 bidder's supporting documents, the reverse tendering process shall be closed declaring the L1 bidder as "successful bidder" and the remaining bidders in the process shall be notified as "unsuccessful" and their respective EMDs shall be refunded. p) In case there are discrepancies between the L1 bidder's declarations under the technical and financial criteria and the supporting documents submitted, the L1 bidder shall be disqualified, his EMD shall be forfeited, he will be removed from the reverse tendering process and the remaining bidders shall be notified of the date and time when the reverse tendering process shall be resumed. q) The reverse tendering process shall be resumed with the L2 price as the Maximum Allowable Bid Price. r) Only 15 minutes shall be initially allowed for the remaining bidders to revise their bids, subject to automatic extensions of 15 minutes in case of any reduction in bids recorded in the prior 15 minutes. s) The reverse tendering process shall continue until the determination of a successful bidder.
29.	Statutory Requirements	The Tenderer shall fulfill the following statutory requirements. **a)** GST The tenderer should have registration under GST from concerned department. The rates are exclusive of GST. Applicable GST as on

		date will be allowed against submission of GST invoice.
30.	General Terms & Conditions**:**	Bid Notification - APSPCL Bid Notice No. **APSPCL-e-E-27/2022-23/EE/ Tech./APSPCL, Dt.26.05.2022** i) Bids are invited on the e-procurement platform for the above-mentioned procurement from the firms eligible. i) Bid security is to be paid through online payment through e-procurement portal. Exemption for payment of bid security is not allowed in any case. Permanent bid security bank Guarantee is not accepted. ii) Bid schedules: Bid schedule can be downloaded free of cost from the web site tender.apeprocurement.gov.in i) The bidder is subject to be disqualified, if he is found to have mislead or furnished false information in the forms / Statements / Certificates submitted in proof of qualification requirements and any record of abandoning of work, not fulfilling contractual obligations in earlier contracts, inordinate delays in completion of works, litigation history, financial failures or participating in the previous Bidding for the same work and quoting unreasonably high price. ii) Even while execution of the contract, if it is found that the bidder had produced false/fake certificates of experience, he will be black listed and the contract will be terminated and his Bid security will be forfeited and contract will be carried through other agency at his cost and risk. a) Transaction fee: The participating bidders have to pay transaction fee of 0.03% on Estimated Contract Value (ECV) with a cap of Rs 11,800/- (Rupees Eleven Thousand and Eight Hundred only) including GST@18% for all tenders with ECV upto Rs. 50 Crores plus service charges @18%, and Rs.25000/-(Rupees Twenty-Five thousand only) plus service charges @18% for tenders with Estimated Contract Value (ECV) above Rs.50.00 crores on line payment gateway with any master/visa credit card issued by any Bank and through net Banking facility (direct debit) with AXIS/ICICI or HDFC Banks at the time of bid submission. Submission is mandatory as per GO Ms No.13. Payment of transaction fee through DD will not be accepted". b) Corpus Fund: The successful bidder shall pay an amount equivalent to 0.04% of ECV (estimated contract value) with a cap of Rs. 10,000 (Rupees ten thousand only) for all tenders with ECV upto Rs. 50 Crores and Rs.25000/-(Rupees Twenty-Five thousand only) for tenders with

		ECV above Rs.50.00 crores on e-Procurement platform before entering into agreement/issue of purchase orders, towards e-Procurement fund in favour of Managing Director, APTS, Vijayawada through the Agreement authority. iii) In case of discrepancy with Bid conditions in the Bid document and NIT, the condition in the Bid document prevails. **Note:** a) Any other condition regarding receipt of Bids in conventional method appearing in the Bid documents may please be treated as not applicable. b) The contractors are to upload the information preferably in Zip format. c) The contractors should upload the documents duly singing each and every paper.
31.	Documents to be submitted (Hard copies) to the Tender inviting authority*	The tenderer is liable for disqualification, if he is found to have mislead or furnished false information in the Forms / Statements / Certificates submitted in proof of qualification requirements and record of performance such as abandoning of work, not properly completing of earlier contracts, inordinate delay in completion of works, litigation history, financial failures and/or participated in the previous tendering for the same work and has quoted unreasonably high price, etc. Even while execution of the work, if found that the contractor had produced false/fake certificates of experience, he will be black listed, the contract will be terminated and his Bid security will be forfeited and <u>work will be carried out through other agency at his cost and risk.</u> **The tenderer shall furnish the declaration that:** 1) They have not been black listed in any department due to any reasons. 2) They have not been demoted to lower category in any department for not filing the tenders after buying the tender schedules in a whole year and their registration have not been cancelled for a similar default in two consecutive years. 3) They will agree to get disqualified themselves for any wrong declaration in respect of the above and get their tender summarily rejected. 4) The soft copies uploaded by them shall be genuine. Any incorrectness / deviation noticed will be viewed seriously apart from canceling the work duly forfeiting the Bid security. Criminal action will be initiated including suspension of business and/ or black listing.
32.	Other relevant information	• APSPCL reserves the right to reject any or all the tenders without assigning any reasons thereof. • APSPCL reserves the right to amend or modify the tender and its

		conditions before 22.06.2022 (The details will be updated in APSPCL web site) • Any other condition regarding receipt of tenders in conventional method appearing in the tender documents may please be treated as not applicable. • The contractors have to upload the information preferably in Zip format. • The contractors should upload the documents duly signing each and every paper. For all clarifications & guidance, the bidders may contact the Executive Engineer/Tech/ APSPCL/ Tadepalli, Guntur District – 522 501.
33.	Material Quantity/Items Including CIVIL	• **The material/items list enclosed in schedule- A (Supply of materials), schedule B (Erection Electrical portion) & schedule -C (Civil portion) are tentative, actual quantities shall be arrived based on the site conditions & approved drawings** .

Sd/xxx
Executive Engineer/Technical

To
The Bidders through Notice Board / Web Publication.
The Dy. CCA/APSPCL/Tadepalli, Guntur District, A.P.
The Superintending Engineer/Civil/APSPCL/Tadepalli, Guntur District, A.P.
The Dy. Executive Engineer/Electrical/APSPCL/Kadiri, Ananthapuramu District, A.P.
The Dy. Executive Engineer/Electrical/APSPCL/ Kurnool District, A.P.
The Dy. Executive Engineer/Electrical/APSPCL/Kadapa District, A.P.

I N D E X

INSTRUCTIONS TO THE BIDDERS

1.0 **General**: The APSPCL invites bids for the works mentioned in the NIT and Project Data sheet for which dates and time specified in the NIT and will be opened by either Bid inviting authority or his nominee at his office on the date and time mentioned in the NIT. The details of Bid inviting authority are mentioned in the Project Data Sheet.

1.1 The Bids should be in the prescribed form invited on e-procurement as specified in NIT and Bidding documents which can be downloaded free of cost from the website www.ap.eprocurement.gov.in

1.2 The dates stipulated in the NIT are firm and under any circumstances they will not be relaxed unless officially extended by APSPCL in e-procurement plat-form.

1.3 The e-Procurement application is PKI enabled and supports the digital certificates issued by APTS for signing the bids at the time of submission by bidder. **The bidder has to procure the digital certificates issued by APTS Ltd., Vijayawada** by following the procedure laid for the same. Digitally signed bids are to be submitted electronically through e-procurement without which the Bid will not be considered for opening.

1.4 The intending Bidders would be required to enroll themselves on the 'e'-procurement market place at www.ap.eprocurement.gov.in. If the bidders intend to know the procedure of bid submission on e-procurement platform, suitable training will be given by **M/s VAYAM Technologies Ltd., Vijayawada**. The bidder would be required to register on the e- procurement market place www.ap.eprocurement.gov.in and submit their bids online.

1.5 The Bidder should upload scanned copies as specified in checklist and all enclosures required for the schedules and Appendices. The bidder should produce the originals of all uploaded documents for verification if asked for by the Competent Authority within 3 (Three) days.

1.6 The uploading of bids on-line through e-procurement cannot be possible after expiry of due date and time and Bid opening Authority will not consider any requests for extension.

1.7 The successful Bidder is expected to complete the work within the time period specified in the Schedule – C .

1.8 APSPCL reserves the right to cancel/extend/alter the bid conditions at any time. In the process, if the tender process / works are stalled due to legal intervention or due to natural calamities, no compensation will be paid.

2.0 Bidders / Firms eligible to Bid:

The Bidders / Firms who Possess the valid registration and satisfies all the conditions therein.

i) Are not blacklisted or debarred or suspended by the Government /any power utility for whatever the reason, prohibiting them not to continue in the contracting business.
ii) Have complied with the eligibility criteria specified in the Clause 3 of General Terms &Conditions Section -1 of this Specification are the eligible Bidders /Firms.

2.1 Bidders / Firms ineligible to Bid:

(i) A retired officer of the Govt. of AP or Govt. of India or APSPCL is disqualified from tendering for a period of two years from the date of retirement without the prior permission of the Parent Department. The contractor shall intimate the list of his employees who were retired from Government/APSPCL along with the permission possessed from parent department. The contractor shall intimate the list of his employees who were retired from Government/APSPCL along with the permission, they posses from parent department.

(ii) The Bidder who has employed any retired officer as mentioned above shall be considered as an ineligible Bidder.

(iii) The contractor himself or any of his employee is found to be Gazetted Officer who retired from Government Service and had not obtained permission from the Government for accepting the contractor's employment within a period of 2 years from the date of his retirement.

(iv) The Contractor or any of his employees is found at any time after award of contract,to be such a person who had not obtained the permission of the Government as aforesaid before submission of the Bid or engagement in the Contractor's service.

(v) Contractor shall not be eligible to Bid for works in APSPCL where any of his near relatives are employed in the rank of Assistant Engineer or Assistant Executive Engineers and above on the Engineering side and Assistant Accounts Officer and above on the accounts side. The Contractor shall intimate the names of persons who are working with him in any capacity or are subsequently employed. He shall also furnish a list of APSPCL Employees related to him. Failure to furnish such information Bidder is liable to be removed from the list of approved contractors and his contract is liable for cancellation.

Note: Near relatives include

a) Sons, step sons, daughters, and step-daughters.
b) Son-in-law and daughter-in-law.
c) Brother-in-law and sister-in-law.
d) Brothers and Sisters.
e) Father and Mother.
f) Wife / Husband.
g) Father-in-law and Mother-in-law
h) Nephews, nieces, uncles and aunts
i) Cousins and any person residing with or dependent on the contractor.

3.0 Documents to be furnished for Qualification requirements of the Bidders:

3.1 The Bidder shall furnish the following particulars in the formats provided online and supported documentary evidence shall be uploaded.
Attested copies of documents relating to the Registration of the firm with APTRANSCO/APSPCL, Registration as valid Electrical Licensed Contractor, Financial turn over statement certified by CA, Latest Income Tax Clearance certificate / PAN number from IT Department, GST registration, Labour department registration,

Experience certificate in similar nature of works, Self-Declaration etc.

Note: The Partnership firms, which are registered as Contractors shall intimate the change in partnership deed, if any, as per GO Ms No.58, I & CAD, dt.23.4.2002 within one month of such change. Failure to notify the change to the registration authority in time will entail the firms to forfeit their registration and their Bid will be rejected. The intimation of change of partners if any and the acceptance by the Registration authority may be enclosed. Further the change if any in the official address, phone/fax numbers etc., shall be intimated.

3.2 Availability of key personnel for administration /site management and execution viz., technical personnel required for the work.

3.3 Qualification criteria for opening of the bid: Bidders qualified in the Technical /Pre-qualification Bid if they meet the requirements as per clause no. 3 'Qualification Requirements' of Section -1

3.4 Even though the Bidders meet the above qualification requirements, they are liable to bedisqualified / debarred / suspended / blacklisted if they have

a) Furnished false / fabricated particulars in the forms, statements and /annexures submitted in proof of the qualification requirements and/or
b) Not turned up for entering into agreement, when called upon with in the time specified in the letter of acceptance
c) Record of poor progress such as abandoning the work, not properly completing the contract, inordinate delays in completion, litigation history or financial failures etc., and
d) A history of criminal record in which the Bidder is involved if any.
e) History of litigation with Government/APSPCL during the last 5 years in which the Bidder is involved.

3.5 Even while execution of the work, if found that the work was awarded to the Contractor based on false /fake certificates of experience, the Contractor will be blacklisted and work will be taken over.

3.6 The bidders shall submit a written Power of Attorney authorizing the signatory of the bid tocommit on behalf of the bidder.

3.7 Bidders are advised to find out the latest tax structure, applicability and rates before quoting. Further to reduce the billing difficulties, bidders are advised to round-off thebasic prices and F & I to the nearest Rupee and taxes and duties to nearest two decimal places by using 'Round' formula in Excel sheets.

3.8 SITE VISIT: The bidders are advised to visit and examine the site of proposed Substationsand obtain all information that may be necessary for preparing the bid such as access to site, communication, transport, leads / and availability forwater, sand, metal etc., right of way, the quantity of various items of work, the availability oflocal labour, availability and rates of materials, local working conditions, uncertainties of weather and period of crops and working seasons etc. The cost of visiting the site shall be at bidder's own expense. Ignorance of site conditions shall not be accepted by the Purchaser asbasis for any claim for compensation at a later date. The submission of a bid by the bidder will be construed as evidence that such an examination was made and

later claims/disputes in this regard shall not be entertained.

3.9 It is the responsibility of the bidder to satisfy himself that sufficient quantities of constructionmaterials required for the works shall exist in the borrow areas or quarries sites. The APSPCL does not accept any responsibility either in identifying the quarries or procuringthe material or any other facilities in this regard. The bidder will not be entitled for any extra cost /rate or claim for the misjudgment on his part for quantity and quality of materials available in the quarries.

4.0 SUBMISSION OF BIDS :

The bidders who are desirous of participating in 'e'- procurement shall submit their bids in the standard formats prescribed in Bid documents, displayed at 'e'- market place. The bidders should upload the scanned copies in support of their bids. Bidder should take care that the scanned copies are clear & visible. The bidders shall sign on all the statements, documents,certificates, being uploaded by them, owning responsibility for their correctness / authenticity.

If any bidder uploads the bid without paying BID SECURITY, the bid will be rejected and thebidder will be black listed. Similarly, if any of the certificates, documents, etc., furnished by thebidder is/are found to be false / fabricated / bogus, the bidder will be blacklisted and his BIDSECURITY forfeited.

The bids shall be uploaded on e-procurement platform with all particulars called for in the schedules enclosed to specification. Bid rates shall be furnished in the enclosed schedules only. There shall not be any deviation from the contents, description and quantity of the schedule**.** If the required documents, schedules, forms, supporting documents for Qualifying Requirements (both physical & Financial) are not uploaded on e-platform, the bid will be liablefor rejection.

The information sought-for under schedules regarding qualification, financial status etc., shall be uploaded duly filling by typewritten in the formats attached, without interlineations,alterations or modifications. The bidder shall sign all pages of the bid and at the modification /correction before uploading.

Standard printed conditions uploaded along with the bid will not be considered or accepted. Deviations from the provisions of the specification will not be considered.

It is the responsibility of the Bidder to upload all the scanned documents, Schedules, formats and other documents in the PDF format only. For the Price Bid Schedule-B, the bidder shall enter in the downloaded commercial bid in XL file and the same file has to be uploaded. The Quantities and description against the items of the Schedule-A shall not be modified. It is the responsibility of the Bidder to upload all the documents required to prove regarding his responsiveness to participate in this bidding as per the Qualification Requirements.

The bids once submitted on e-procurement platform can not be with drawn after scheduled bid submission closing date and also during bid validity period.

If any bid is with drawn during the above period the bidder will be blacklisted apart from forfeiting of bid security.

4.1 Submission of Price Bids: The estimated value of the works is given in the Schedule-A. The Bidder has to quote in Schedule-B, the percentage excess/ on par/ less on the total estimated value of the works given in the Schedule-A.

4.2 NA

4.3 Bids will be opened at the time, date and place indicated in the NIT.

4.4 The bidders shall carefully examine the specification and all its enclosures and if they have any doubt as to the meaning of any portion of the specification or enclosures thereto, they shall obtain the required clarifications from the officer to whom the bids are to be addressed**.**

4.5 THE BIDS RECEIVED BY, OTHER THAN E-PROCURMENT PLATFORM SHALL NOT BE ENTERTAINED UNDER ANY CIRCUMSTANCES.

4.6 Clarifications, amplifications, and/or any other correspondence from the bidder subsequent to the opening of bid will not be entertained. The bidders are therefore advised to ensure that their bids are uploaded in complete shape in the first instance itself. Post bid rebates, revisions or deviation in quoted price and/or conditions or any such offers which will give benefit to the bidder over others will not only be rejected straight but the original bid itself will get disqualified on this account and the bidder's bid security amount will be forfeited.

4.7 <u>COMPLETENESS OF BID:</u>

a) The bid shall be quoted for all the works & all the items as per the bid specification.
b) Part bids or incomplete bids will not be accepted and will be rejected.

5.0 I) Contents of the specification:

Volume –I:

a) Instructions To Bidders
b) General Terms & Conditions (Section-I)
c) Technical Specification (Section-II)

Volume-II:

a) Financial Terms & Conditions (Section-III)
b) Schedules (I – XI)
c) Check List (XII)
d) Forms (A- D)
e) List of approved Manufacturers
f) List of approved Banks
g) Price Schedules for Works (Schedule –A)
h) Financial Bid/Price Bid (Schedule – B)
i) Completion period (Schedule – E)
j) Project Data Sheet
k) Price Schedule for Material (Schedule-A)
l) Price Schedule for Erection (Schedule-B)
m) Price Schedule for Civil Works (Schedule-C)
n) Price Schedule for Project Insurance (Schedule-D)

ii) Formats

A) Bank Guarantee proforma for Bid Security
B) Bank Guarantee proforma for performance security.
C) Bid form
D) Format for Bank's Certificate for credit facilities

iii) Schedules: To be filled up and furnished the bid. Schedules are to be filled up by thebidder

a)	Particulars of Registration:	Schedule-I
b)	Details of Technical personnel:	Schedule-II
c)	Details regarding Financial standing:	Schedule-III(A)
d)	Details of works under execution:	Schedule - V (A)
e)	Details of works u.e. other than :	Schedule – V (B)
f)	Details of balance Commitment:	Schedule - V (C)
g)	Under taking with regards to the Q.R:	Schedule - V (D)
h)	Details of gangs available:	Schedule-VI
i)	Details of vehicles and T & P available:	Schedule-VII (A&B)
j)	Undertaking regarding relatives:	Schedule-VIII
k)	Declaration for taking up awarded works:	Schedule-IX
l)	Bank A/c. details for RTGS:	Schedule-X
m)	Check List:	Schedule-XI

NOTE:

1. ***This office is not responsible for any omissions in the bid specification down loaded by the bidders from the web site.***

2. ***The bidders can verify the accuracy of the down loaded bid specification with the master copy available at the office mentioned in the Project Data Sheet.***

3. ***The bidders are requested to check / verify the web site before scheduled closing datefor any changes/ amendments in the tender.***

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SECTION – I: GENERAL

The Andhra Pradesh Solar power corporation PVT Ltd, hereinafter referred to as the APSPCL, invites bids for the Works as mentioned in the **NIT** and **PROJECT DATA SHEET** ofthis Specification.

1. DEFINITION OF TERMS:

In the contract, the following expression shall, unless the contract otherwise requires, have the meanings hereby respectively, assigned to them.

(i) The 'Purchaser/Employer' shall mean the Andhra Pradesh Solar power Corporation Pvt. Ltd and shall include its successors and permitted assigns.

(ii) The 'Bidder' shall mean who submit their bids to APSPCL.

(iii) The 'Contractor' shall mean the bidder whose bid has been accepted by the purchaser and shall include the bidder's heirs, legal representatives, and successors and permitted assigns.

(iv) The 'Manufacturer' shall mean the firm/company named in the contract, to whom the supply of material/ equipment is entrusted by the contractor.

(v) The 'Engineer' shall mean the officer placing the order for the work with the Contractorand such other officer as may be authorized and appointed in writing by the Purchaserto act as Engineer for the purpose of the Contract and in case no such officer has been so appointed, the purchaser or his duly authorized representative.

(vi) The 'Supervising Engineer' shall mean such officer as may be duly appointed from time to time by the Purchaser or his Engineer to take general control and supervisionof work.

(vii) The 'Inspector' shall mean any person or persons nominated by the Purchaser and/or the Engineer to inspect stores or works under the agreement and/or his duly authorized representative appointed to act as the Inspector.

(viii) The 'Contract' shall mean and include the bid and acceptance thereof, the general conditions, special conditions, Specifications, Schedules, drawings, Form of Bid, covering letter, schedules of prices, the final General conditions and the format Agreement executed on the stamped paper.

(ix) The 'Specification' shall mean collectively all the terms, stipulations, and conditions of contract, technical provisions and annexure thereto and list of corrections and amendments mutually agreed upon from time to time in writing.

(x) 'Tests on completion' shall mean such tests, as are prescribed by specification, to bemade by the Contractor to the satisfaction of the purchaser before the work is takenover by the Purchaser.

(xi) 'Commissioning' shall mean the satisfactory operation of the equipment/work as specified, after all necessary initial tests, checks and adjustments required at site, if any,

have been satisfactorily completed and the equipment / works have been in continuous and uninterrupted commercial use for at least 30 days.

(xii) Commercial use' shall mean the use of the work, which the contract contemplatesor of which it is commercially capable.

(xiii) 'Approval' shall mean the written approval of the Engineer and of the statutoryauthorities wherever such authorities are specified by any codes or otherwise.

(xiv) 'Month' shall mean calendar month.

(xv) 'Writing' shall include any manuscript, typewritten or printed, statements, under or over signature or seal as the case may be.

(xvi) 'Letter of Intent' shall mean the purchaser's letter conveying his acceptance of the bid, subject to such reservations as may have been stated therein.

(xvii) 'ECV' shall mean Estimated Contract Value.

(xviii) 'RTGS' shall mean Real Time Gross Settlement.

2. SCOPE OF THE CONTRACT: The brief description of work/ <u>project</u> is mentioned in the NIT and Project Data Sheet. The detailed scope of work/ project is as per the schedules enclosed and as per the technical specification Volume –II.

(A) <u>Substations:</u>

a) The contractor shall prepare layout and drawing in line with APTRANSCO standards for approval.

b) The contractor shall procure the materials / equipment with technical parameters as per the technical specification volume-II, from the approved list of manufacturers/ suppliers only and execute the works as per the approved drawings. It is the responsibility of the contractor to complete the works in full shape and handover to APSPCL in fully operational condition within the time specified in the contract.

c) Being the semi turnkey work, if any petty/ minor items required for erection of the substations & lines, even though they have not been specifically included in this specification but are necessary for successful erection / operation of the substations & lines are deemed to be included in the specification.

3. QUALIFICATION REQUIREMENTS:

3.2 <u>Physical Experience Requirements:</u> For awarding "Augmentation of 220/33kV Pooling Substation-2 - Supply, Erection including civil works, Testing and Commissioning of 2 Nos. 220/33kV Power Transformers Bays at Galiveedu site of Ananthapuramu Ultra Mega Solar Park (1500 MW). A.P." the bidder should meet the following

1. The bidder should have valid 'A' Grade Electrical Contractor's license exceeding 33KV voltages as on Technical Bid Opening date.

2. The firm should have valid registration from registrar of firms or register of companies.

3. The bidder should have executed at least the following works in the last 10 years as a prime contractor / as a lead partner for qualifying the notified work.

    a) Supply, erection, testing and commissioning of 2 no's 220 kV bays or 1. No .132 KV Substation to any Govt. Power utility/ PSU in India.
    b) The above works shall be Successful operation for at least one year. The bidder shall enclose the proof of successful operation of 1 year.

4. **FINANCIAL TURNOVER:** The bidder should have aggregate turnover of 3 times of estimated contract value during last three preceding financial years put together i.e. from FY 2018-19 to FY 2020-21. The bidder shall submit annual turnover certificate duly certified by Chartered Accountant (CA).

5. Liquid asset/credit facilities/Solvency certificate (not older than 12 months from the date of availability of tender specification on e-procurement platform) issued by any Indian Nationalized Bank or scheduled bank of value not less than 50% of estimated contract value.

3.3 QUALIFICATION REQUIREMENTS:

The Bidder should upload the supported documents which are mandatory

S.No.	Document Name	Document Type
1	EMD	Mandatory
2	Transaction Fee payable to APTS	Mandatory
3	GST Registration	Mandatory
4	Experience Certificate.	Mandatory
5	Valid 'A' grade electrical license, for all voltages exceeding 33 KV	Mandatory
6	Registration Certificate with any Govt. Sector	Mandatory
7	Financial Turnover of the bidder (Schedule – III(B) and Schedule V(C) certified by CA) (or) Financial Turnover certificate and Schedule V(C) certified by CA)	Mandatory
8	Declaration on a non-judicial stamp paper of Rs.100/- duly notarized (Schedule – XII)	Mandatory
9	Income Tax document and PAN Card	Mandatory
10	Any other documents required as per Tender Schedule	Optional

The bidder shall meet the qualification requirements mentioned notified item .The bidder should furnish documentary evidence in support of the qualifying requirements stipulated as above certified by Order Placing authority of the concerned Power utility/Government Organizations.

3.4 Bid capacity.

No relaxation will be given to any of the qualification criteria.

3.5 Responsibility for correctness of the information submitted in the bid lies with bidder. If any information furnished in the bid is proved to be false at a later date, the bid will not only be rejected but the bidder will be BLACKLISTED.

4.1 PERFORMANCE BASED EXPERIENCE : - NA

5. BID VALIDITY: -

180 days from the Bid submission closing date. Bids having validity less than 180 **days** are liable for rejection at the discretion of Andhra Pradesh Solar Power Corporation Private Limited.

6. Performance Bank Guarantee:

The successful bidder shall submit performance bank guarantee for **5%** value of the contract within 15 days after award of contract. The performance bank guarantee shall be valid for the proper fulfillment of contract with a validity of 24 months over and above the completion period with two months claim period from any Nationalised or scheduled bank in favour of Chief Executive Officer/APSPCL. The performance bank guarantee will be released after 24 months from the date of completion of the work. The Performance Bank Guarantee shall be forfeited if the Company does not fulfill any of the terms and conditions of the agreement.

6.1 NOTE:

Online payment receipt of EMD and Scanned documents shall be uploaded along with the Bid, and the successful bidder shall invariably furnish the originals to the APSPCL before entering into agreement either personally or through Registered post /Courier and the receipt of the same within stipulated date shall be the responsibility of the successful bidder. Failure to furnish the original documents on or before above stipulated date and time the successful bidders will be suspended from participating in tenders on e- Procurement platform for a period of 3 years apart from blacklisting.

6.2 The E.M.D. shall be forfeited

(a) If the Tenderer withdraws the Tender during the validity period of Tender.

(b) In the case of a successful tenderer, if he fails to sign the Agreement for whateverthe reason.

(c) If fails to furnish the required security deposit.

7. DISCREPANCIES: If a discrepancy arises between

i) The total lump sum rate quoted in the e-procurement platform and in the Schedule-B, the total lump sum rate quoted in the e-procurement platform will govern.

The bidder shall show the total schedule without last five **fail.** Corrections if any shall be madeby crossing out, initialing, dating and rewriting.

8. EVALUATION OF BIDS: The bids will be opened on-line by bid inviting authority or hisassignee at the time and date specified in the Bid documents.

Physical and Financial capacities of all the bidders will be evaluated based on the documentary evidence furnished along with the bid. No correspondence will be entertained after opening of the bids. Evaluation of Technical/ Commercial and Price bids will be made based on the available documentary evidence submitted along with the bid. If any information furnished in the bid is proved to be false later, the bid will not only be rejected but the bidder will be black listed.

If any significant discrepancies are observed in the Technical/Price schedules of any bid, due to which the bidder becomes lowest and withdraws the bid, the bid will be liable for rejection and forfeiture of Bid security and also liable for black listing of the bidder.

The Bids are liable for rejection for any of the deviations mentioned below.

(a) No Bid Security or Insufficient Value or Validity of Bid Security
(b) Insufficient Validity of the Bid.
(c) Non-uploading of the required documents, schedules, forms, supportingdocuments for Qualifying Requirement. Insufficient or illegible supportingdocuments, schedules, forms.
(d) Deviation from the Delivery schedule of the Specification.
(e) Deviation from the Payment terms of the Specification.
(f) Deviation from the General terms and conditions
(g) Deviation from the Technical Specification.
(h) Non-Compliance with the Qualifying Requirements.
(i) Record of Poor Performance in the previous / on-going works. Record of poorprogress i.e. abandoning the work, not properly completing the contract, inordinate delays etc.
(j) Record of Black listing in any other Power Utilities / Government Department.
(k) Record of financial failures if any.
(l) History of litigation with Government/APTRANSCO/APSPCL during the last 5 years.
(m) History of criminal record in which the Bidder is involved.
(n) Non-uploading of the Price schedules. Insufficient or illegible Price Schedules.Change of Quantities / Description of the work / materials items in the Price Schedule uploaded by APSPCL.
(o) Furnishing of false / fabricated particulars in the forms, statements andannexure, submitted in proof of the qualification requirements.
(p) Not turned up for entering into agreement, when called upon with in the timespecified in the letter of acceptance.
(q) Any other deviations of clause mentioned in this specification.

While being equal or compatible in other aspects preference will be given to those bidders who have good experience / proven performance, past experience is superior in terms of quality and timely completion in similar works.

It is the sole discretion of APSPCL regarding finalization of the bids. Mere

quoting and becoming of L1 (Lowest quoted) bidder shall not automatically entitle any rights for any bidder for award of contract. The past performance of the contractor and performance of the contractor in the ongoing works shall be taken into account while finalizing the bids. The APSPCL reserves its right to reject any or all the bids and not to accept the lowest or any other without assigning reasons. The APSPCL reserves its rights to cancel the tender at any stage without assigning the reasons.

9. NOTIFICATION OF AWARD AND ACKNOWLEDGING:

a) The Bidder who's Bid has been accepted will be notified, the award of the work by Bid inviting authority prior to expiration of the Bid validity period by registered letter / Fax. This letter (hereinafter and in the Conditions of Contract called "Letter of Acceptance") will indicate the sum that the Corporation (APSPCL) will pay the Contractor in consideration of the execution, completion, and maintenance of the Works by the Contractor as prescribed by the Contract (hereinafter and in the Contract called the "Contract Amount").

b) When a Bid is to be accepted, the concerned Bidder shall attend the office of the Bid inviting authority on the date fixed in the Letter of acceptance. Upon intimation being given by the Bid inviting authority, of acceptance of his Bid, the Bidder shall make payment of the balance Security Deposit and additional security deposit wherever needed by way of Demand Draft or unconditional and irrevocable Bank Guarantee obtained from approved Bank with required validity period and sign an agreement in the form prescribed by the department for the due fulfillment of the contract. Failure to attend the office of the Bid inviting authority, on the date fixed, in the written intimation, to enter into the required agreement or failure to submit the Performance and Additional Securities as intimated in Letter of Acceptance shall entail forfeiture of the Earnest Money deposited. The written agreement to be entered into between the Contractor and the Bid inviting authority or his nominee shall be the foundation of the rights and obligations of both the parties and the contract shall not be deemed to be complete until the agreement has first been signed by the contractor and then by the proper officer authorized to enter into contract on behalf of the APSPCL.

c) Within 15 days of award of the contract the duplicate copy of the award letter shallbe returned by the contractor duly signed and dated.

A formal agreement will be entered into with the contractor within 30 days of acceptance ofthe performance security. If the contractor does not sign the agreement within 30 days of acceptance, his tender will be cancelled forfeiting the EMD paid by him without issuing any further notice and action will be initiated for blacklisting the tenderer, duly calling the next lowest responsive bidder for negotiations.

10. SERVICE CONDITIONS:

The Substation will be operating under the following tropical conditions.

i)	Humidity	-	60 to 80%
ii)	Max.isoceraunic level days per year	-	40 thunder storm.
iii)	Max.temperature in shade	-	45 Deg.C

iv)	Min.temperature in shade	-	10 Deg.C
v)	Max.temperature in sun	-	55 Deg.C
vi)	Altitude above sea level meters.	-	550 meters to 1000

Due consideration will be given to any special devices or attachments, put forward by the bidder which are calculated to enhance the general utility and the safe and efficient operation of the line.

11. CONTRACTOR AND SUB ORDERS: The successful Bidder shall carry out all the works mentioned in the schedules by their company only. Sub-contracting or sub ordering is not allowed by APSPCL.

12. POWER TO VARY OR OMIT WORK: No alterations, amendments, omissions or variations of the works under the contract shall be made by the contractor except as directed in writing by the APSPCL, but the APSPCL shall have full powers to instruct the contractor by notice in writing to make such variations without prejudice to the contract. The contractor shall carry out such variations and be bound by the same conditions as far as applicable as though the said variations occurred in the contract documents. If any suggested variations would, in the opinion of the contractor, if carried out, prevent him from fulfilling any of his obligations under the contract, he shall notify the APSPCL thereof in writing and the APSPCL shall decide forthwith whether or not, the same shall be carried out and if the APSPCL confirms its instructions, contractor's obligations shall be modified to such an extent as may be mutually agreed. Any agreed difference in cost occasioned by any such variation shall be added to or deducted from the contract price as the case may be.

APSPCL reserves the right to allot any surplus materials from APSPCL stores to this project (even though the scope of specification covers supply of materials) duly omitting that part of materials from Schedule-A. In such cases transportation shall be carried out by the Contractor and transporting charges shall be paid as per clause (3) Section-II Financial 'Supplemental Quantities / Items'. The bidders shall supply only the balance materials required after allotment of such materials.

13. EXECUTION OF WORKS RELATING TO POWER LINE CROSSINGS AND RAILWAYCROSSINGS: NA

14. ELECTRICITY RULES:

All works shall be carried out in accordance with the relevant clauses of the Indian Electricity Act and Rules unless modified by this specification. In case of variation between the two, the latter shall be binding on the contractor. Unless otherwise specified, works shall be carried out in accordance with the Indian Electricity Act, Electricity Rules or any revisions thereof, which may be issued during the currency of the contract and the requirements of any other Regulations and Acts in India to which the APSPCL may besubjected to.

All railway tracks, communication lines or other important track crossings androuting the line through Air field region shall conform to the relevant rules and procedures as may be laid down by Railway, Communications, Aviation or other concerned

authorities from time to time.

Aviation signals will have to be provided at the top of the transmission line towers inthe vicinity of civil and military aerodromes or airfield regions, if any. Similar provisions will have to be made on the special river crossing towers. The rates for tower erection shall include such works also.

15. REGULATION OF LOCAL AUTHORITIES AND STATUTES

i) The CONTRACTOR shall ensure compliance with all statutes laws of India, rules and regulations of the Central or State Government or any other authority such as the Workmen's Compensation Act 1923, Payment of Wages Act, Minimum Wages Act 1948, Employees State Insurance Act, Employees Provident Fund Act, etc., and any statutory modifications thereof in connection with employees engaged by him in the work. The contractor's offer shall be presumed to include financial liabilities arising from the above and the purchaser shall not be liable for any extracosts on this account.

ii) The CONTRACTOR shall conform to the provisions of Indian Boiler Regulation, Factory Laws, Indian Electricity Act and rules made there under, and any other acts of legislature relating to the work and to the regulations and bye-laws of anyauthority and of any matter, lighting and other companies and/or authorities with whose systems the plant/structure proposed to be connected and shall, before making variations from the drawings or specifications may be necessitated by so conforming, give to PURCHASER/ENGINEER written notice, specifying the variations proposed to be made and the reason for making it and apply for instructions thereof.

iii) The CONTRACTOR shall arrange to give all notices required by the said Acts, Regulations or Bye-laws to be given to any Authority or to any Public Officer andpay all fees that may be properly chargeable in respect of the 'Works' and lodge the receipts with the PURCHASER/ENGINEER, unless otherwise specified. Obtaining all permits and licenses required thereupon shall be the responsibility ofthe CONTRACTOR.

iv) All registration and statutory inspection fees, if any, in respect of his work pursuantto this 'Contract' shall be to the account of the CONTRACTOR. However, any registration, statutory inspection fees lawfully payable under the provisions of the Indian Boiler Regulations and any other statutory laws and its amendments fromtime to time during erection in respect of the plant and equipment ultimately to be owned by the PURCHASER shall be to the account of the PURCHASER. Shouldany such inspection or registration need to be re-arranged due to the fault of the CONTRACTOR or his VENDOR, the additional fees for such inspection and/or registration shall be borne by the CONTRACTOR.

16. CO-ORDINATION WITH STATUTORY BODIES AND OTHER AGENCIES

The Contractor is fully responsible for carrying out all co-ordination and liason work to be required with Electrical inspectors, Factory inspector and other statutory bodies for implementation of the work. The application on behalf of the Purchaser for submission to the electrical inspector and other statutory bodies along with copies of drawings complete in all respects shall be done by the Contractor and approval/ certificates taken well ahead of time so that the actual commissioning of equipment/ materials is not delayed for want of inspection and approval by the inspector and statutory bodies. The actual inspection work by the electrical inspector shall be arranged by the Contractor. However, any fees paid to electrical

inspector/ statutory bodies, etc., in this regard shall be borne by the Purchaser. Any modification on the installation suggested by the electrical inspector or any other statutory authority shall also be carried out by the contractor at no extra cost by the Purchaser.

17. CO-OPERATION WITH OTHER CONTRACTORS

The Contractor shall co-operate with all other contractors or tradesmen of the Purchaser, who may be performing other Works on behalf of the Purchaser and the workmen who may be employed by the Purchaser and doing work in the vicinity of the Works under the contract. The Contractors shall also so arrange to perform his work as to minimize, to the maximum extent possible, interference with the work of other contractors and their workmen. Any injury or damage that may be sustained by the employees of the other contractors and the Purchaser, due to the Contractor's work shall promptly be made good at his own expense.

The *purchaser* / Engineer shall determine the resolution of any difference or conflict that may arise between the Contractor and other contractors or between the Contractor and the workmen of the Purchaser in regard to their work. If the Works of the Contractor is delayed because of any acts or omissions of another contractor, the Contractor shall have no claim against the Purchaser on that account other than an extension of time for completing his Works. However extension of time will be considered after examination of its merits and at the discretion of the purchaser.

18. CONTRACTOR'S COOPERATION WITH THE PURCHASER

In cases where the performance of the erection work by the CONTRACTOR affects the operation of the system facilities of the PURCHASER/ENGINEER, such erection work of the CONTRACTOR shall be scheduled to be performed only in the manner stipulated to be performed by the PURCHASER/ ENGINEER and the same shall be acceptable at all times to the PURCHASER/ ENGINEER. It will be the responsibility of the CONTRACTOR to provide all necessary temporary instrumentation, measuring devices and all other material/ arrangements required during the work for proper functioning of the equipment.

The CONTRACTOR at all times shall work in coordination with the PURCHASER/Engineer's staff and offer them all reasonable facilities to become familiar with the erection, operation and maintenance of the equipment.

In respect of observations of local rules, administrative orders, working hours etc., the CONTRACTOR and his personnel shall cooperate with the PURCHASER/ENGINEER.

19. EMPLOYMENT OF TECHNICAL STAFF FOR SUPERVISION, SKILLED AND UNSKILLEDLABOUR:

The contractor shall provide experienced, technically qualified supervising Engineers for the supervision. The Chief Supervising Engineer of the contractor or his agent shall have full power as the representatives of the contractor who can negotiate at site in regard to executionof the contract. The minimum qualification of site Engineer is a degree in Engineering. The contractor must make his own arrangements for recruiting skilled, semi- skilled and un-skilled labour in sufficient numbers. The contractor shall engage only competent skilled workers. The Divisional Engineer/ In-charge of the work will have the right to remove any skilled worker employed by the contractor, if found not suitable.

The contractor shall employ following Technical Staff indicated against each work.

Work	Technical Personnel to be employed by the Contractor
220 kV or 33 kV Sub-Station or Switching Station	1 B.Tech / B.E Electrical +1 B.Tech / B.E Electrical +1 Diploma Electrical
220kV/33 kV bays	1 Diploma Electrical +1 Diploma Civil

In case of failure of the contractor to employ technical staff during execution as above, recovery shall be made from his bills at Rs. 10,000/- per month for each work, besides other penal action.

The contractor shall make his own arrangements for engagement of all labour, local or otherwise, their transportation, housing, feeding and payment thereof, in accordance with labour law, unless the contract otherwise provides. No idle labour payment will be made to the contractor.

19.1 FACILITIES TO WORKERS

Minimum facilities for workers as per Factory Act and other relevant acts shall be provided for by the CONTRACTOR.

If the CONTRACTOR fails to do so, the same shall be provided by the Purchaser and deducted the same from the CONTRACTOR'S bills.

First-Aid

The Contractor shall provide necessary first-aid facilities for all his employees, representatives and workmen working at the Site. Enough number of Contractor's-personnel shall be trained in administering first-aid.

Cleanliness

The CONTRACTOR shall be responsible for keeping the entire area allotted to him clean and free from rubbish, debris etc., during the period of 'Contract'. The CONTRACTOR shall employ enough number of special personnel to thoroughly clean his work area. All such rubbish and scrap material shall be stacked or disposed in a place to be identified by the PURCHASER/ENGINEER. Materials and stores shall be so arranged as to permit easy cleaning of the area. Similarly, the offices of the CONTRACTOR shall be kept clean and neat to the entire satisfaction of the PURCHASER/ENGINEER. Proper sanitary arrangements shall be provided by the CONTRACTOR, in the work areas and office of the CONTRACTOR and residential colonies. If contractor fails to comply with these requirements inspite of instructions from the Purchaser, the areas will be cleaned by the Purchaser at contractor's cost and the cost of the same will be deducted from the contractor's due amounts.

20. LIABILITY FOR ACCIDENTS TO PERSONS:

a. The contractor shall indemnify the purchaser against all actions, suits, claims, demands, cost or expenses arising in connection with injuries suffered by persons employed by him, on the works whether under the General Law or under the Workers Compensation Act.1923 or any other statute in force at the date of the contract dealing with question of liability of employer for injuries suffered by employees and have taken steps properly to insure against any claims there under. Contractor should take insurance cover to all his workmen for injuries, disablement and death. All compensation against workmen's

compensation act should be settled by the Contractor.

b. On the occurrence of an accident which results in the death of workmen employed by the contractor which is due to the contract work and of so serious as to be likely to result in the death of any such workman, the contractor shall within 24 hours of happening of such accident intimate in writing to the Engineer and such other officers required by the provision of the workmen's compensation act, the fact of such accident. The contractor shall indemnify the APSPCL against all loss or damage sustained by the APSPCL resulting directly or indirectly from his failure to give information in the manner aforesaid including the penalties or fines if any payable by the APSPCL as a consequence of the APSPCL's failure to give notice under the workmen's compensation act or otherwise conform to the provisions of the said act in regard to suchaccident.

c. In the event of any claim being made, or action brought against the purchaser involving the contractor and arising out of the matters referred to and in respect of which the contractor is liable under the clause of the contract shall be immediately notified thereof, and he shall conduct all negotiations for the settlement of the same or any litigation that may arise there from.

d. In the event of an accident in respect of which compensation may become payable under workmen's compensation act VIII of 1923 and any subsequent amendment thereof, whether by the contractor or by the APSPCL, as principle it shall be lawful for the Engineer to retain out of moneys due and payable to the contractor such sum or such sums of money as may be in the opinion of the said Engineer be sufficient to meet such liability. The opinion of the Engineer shall be final in regard to all matters arising under this clause and will not be subject to any claim.

e. Liability for damage or loss to third party including inspection officers due to act of the contractor or by his representatives connected with the execution of this contract shall be fully borne by the contractor. The contractor shall maintain such detailed records to furnish information regarding engagement and discharge of all workmen employed under this contract as to be adequate for the timely and full settlement of claims under the workmen's compensation act. All cases of accidents or injuries shall be reported to the Engineer with full details required for the settlement under the workmen's compensation act.

f. The contractor should report about all accidents within 24 hours to the Engineer of the APSPCL in the preliminary accident form. He should furnish other particulars such as medical certificates, wage particulars, fitness certificates, and proof of having paid the compensation as per the rules in vogue in the due course without delay.

21. LIABILITY FOR DAMAGE TO WORKS AND PLANTS:

a. The contractor during the progress of the work shall take every reasonable, proper, timely and useful precaution against accident or injury to the workmen from any cause and shall remain answerable and liable for all the accidents or injuries thereto which until the same,or be occasioned by the acts of omissions of the contractor or his workmen or his representatives and all losses and damages to the works as aforesaid, shall be made inthe most complete and substantial manner by and at the sole cost of the contractor and tothe reasonable satisfaction of the Engineer. Should such loss or damage happen to units of works or plant or materials falling outside the scope of this contract and due to the lapses of the contractor, these shall be replaced or compensated for by the contractor to the

satisfaction of the Engineer.

b. In the case of loss or damage to any portion of the work occasioned by the allowable causes, the same shall if required by the purchaser, be made good by the contractor in like manner but at the cost of the purchaser at a price to be agreed between the contractor and the purchaser and the purchaser shall pay to the contractor the contract value of the portion ofthe work so lost or damaged or any balance of such contract value remaining unpaid as the case may be.

c. Until the work shall be or deemed to be taken over as aforesaid, the contractor shall alsobe liable for and shall indemnify the purchaser in respect of all damage or injury to any person or to any property of the purchaser or other occasioned by the act of the contractoror his workmen or his representatives or by defective design, work or materials but not due to cause beyond his reasonable control.

d. Provided that the contractor shall not be eligible under the contract for any loss of profit or loss of contracts or any claims made against the purchaser not already provided for in the contract, not for any damage or injury caused by or arising from the acts of the purchaseror of others (save as to damage by fire, as hereinafter provided) due to the circumstancesover which the contractor has not control nor shall his total liability for loss, damage or injury exceed the total value of the contract.

22. APPROVAL OF SUB-VENDORS FOR EQUIPMENT / MATERIALS AND APPROVAL OF GENERAL TECHNICAL PARTICULARS, DRAWINGS, BOMS ETC.

The materials / equipment required for this project shall be invariably purchased fromthe approved manufacturers who have already been supplied similar materials to APSPCL/APTRANSCO and have proven performance.

The bidder shall furnish in Schedule-E, the list of manufacturers to a maximum of three companies per each material which were considered while quoting the prices and from whomthey are going to purchase the materials if order is placed.

All the equipment / material offered in the Bid shall be fully type tested as per the relevant standards. The type tests should have been conducted not earlier than 5 years from the dateof bid opening. If the type tests conducted are earlier than 5 years the bidder shall arrange toconduct type tests at his own cost.

The bidder shall submit all the type test certificates and General Technical Particulars of equipment / material along with the bid.

Within 15 days of receipt of the Letter of acceptance, the Contractor shall finalize the sub-vendors for the list they have submitted in the bid and submit the finalized vendorlist to APSPCL for approval along with the GTPs, Drawings, BOMs etc., Any delay in submitting the above list will lead to delay in execution of the project and the responsibility lies with the Contractor.

23. QUALITY ASSURANCE PLAN:

The Quality Assurance Plan of APSPCL is appended to this specification. The bidders

are advised to go through the same before quoting the bids. The successful bidder will have to adhere to the Quality Assurance Plan during execution of works.

Bidder shall maintain the quality standards as per specification and shall attend the remarks of APSPCL Quality Control wing on top most priority without any reminders from APSPCL.

24. QUALITY CONTROL & INSPECTIONS

Standard: The goods supplied under this contract shall conform to the standards mentioned in the Technical Specifications and when no applicable standard is mentioned, the standard specified by the Institution of Central/State Government or internationally recognized Institutions shall be applicable and such standards shall be of latest version issued by the concerned institution.

Inspections and Tests:

i) The purchaser or his representative shall have access to the Contractor's or Manufacturer's work at any time during working hours for the purpose of inspecting and testing the materials during manufacturing of the materials / equipment and may select test samples from the materials going into plant and equipment.

ii) The inspections and tests may be conducted in the premises of the manufacturer/supplier, at the point of delivery and/or at the final destination stores i.e., at the site. Where tests are conducted in the premises of Manufacturer /supplier, all reasonable facilities and assistance including access to drawings and production data shall be furnished at no extra charge to the Purchaser.

iii) Should any inspected or tested materials fail to conform to specifications, the inspection officer may reject them and the Manufacturer / supplier shall either replace the rejected materials or make all alterations necessary to meet specification requirements free of cost to the Purchaser.

iv) The Purchaser's right to inspect, test and where necessary, reject the materials/equipment after their arrival at the site, shall in no way be limited or waived by reason of the materials/equipment having been previously inspected, tested and passed by the Purchaser or his representative prior to the dispatch

v) The cost of making any test shall be borne by the contractor, if such test is clearly intended by or provided for in the contract. The materials ie clamps, Bolts & Nuts, Conductor, Tower material, poles,etc which will be procured by the bidder should be offered for inspection .

the inspection of materials will be done by the APSPCL. No material should be utilized without approval of APSPCL.

Cost of tests not provided for: APSPCL may decide to conduct certain other tests notcovered in this specification on the materials supplied by the bidder by an independent personor agency at any place other than the site of the place of manufacture of the materials. The cost of such tests shall still to be borne by the contractor. If the tests show that the workmanship or quality

of materials are not in accordance with the provisions of the contractthe same may be replaced with new one conforming to specification at Contractor's cost.

Quality of Materials and Workmanship: All materials and workmanship shall be of the respective kinds described in the contract and in accordance with the Engineer's instructions and shall be subjected to change from time to time to such tests as the Engineer may direct at the place of manufacture or fabrication or on the site or at all or any such places. The contractor shall provide such assistance, instruments, machines, labour and materials that are normally required for examining, measuring and testing any work and the quality, weight or quantity of any materials used and shall supply samples of materials before incorporation in the works, for testing as may be selected and required by Engineer.

Cost of Samples: The contractor at his own cost shall supply all samples, if the supply thereof is clearly intended by or provided for in the contract.

Uncovering and Making Openings: The APSPCL reserves the right to uncover and examine any part of the works if it is found to be not according to specification. The contractor shall uncover any part of the works or make openings as the Engineer may from time to time direct and shall reinstate and make good such part or parts to the satisfactionof the Engineer.

Inspection of operation: The Engineer and any person authorized by him shall at all times have access to the works and to all work shops and places where work is being prepared or from where materials are being obtained for the works and the contractor shall afford every facility and every assistance in or in obtaining the right to such access.

Removal of improper work and materials:

a) The APSPCL representative shall, during the progress of works, have powerto order in writing from time to time the removal from the site within one week of receipt of notice, of any materials which in their opinion are not in accordance with the contract.

b) In case of default on the part of the Contractor in carrying out such an order, the APSPCL shall be entitled to employ and pay other persons to carry out the same and all expenses consequent therein or incidental thereto shall be recoverable from the contractor by APSPCL from any money due to or which may become due to the contractor.

INSPECTION, DURING ERECTION: The provisions of the clauses entitled in the specification for other sections Inspection, Testing and Inspection Certificates shall also be applicable to the erection portion of the Works. The PURCHASER/ENGINEER shall have the right to re-inspect any equipment though previously inspected and approved by him, at the CONTRACTOR's works, before and after the same are erected at Site. If by the above inspection, the PURCHASER/ENGINEER rejects any equipment, the CONTRACTOR shall make good for such rejections either by replacement or modifications/repairs as may be necessary to the satisfaction of the PURCHASER/ENGINEER. Such replacements will also include the replacements or re-execution of those works of other CONTRACTORS and/or agencies, which might have got damaged or affected by the replacements or re-work done bythe CONTRACTOR's work.

ACCESS TO SITE AND WORKS ON SITE: Suitable access to and possession of the 'Site' shall be afforded to the CONTRACTOR by the PURCHASER in reasonable time.

The work so far as it is carried out on the Purchaser's premises, shall be carried out at such time as the Purchaser may approve.
In the execution of the Works, no persons other than the Contractor or his duly appointed representative, Sub-contractor and workmen, shall be allowed to do work on the Site except by the special permission, in writing of the Engineer or his representative.
Access to the 'Site' at all times shall be accorded to the PURCHASER/ENGINEER and other authorized officials and statutory Public Authorities. Nevertheless, the CONTRACTOR shall not object to the execution of the work by other Contractors or tradesmen whose names shall have been previously communicated in writing to the CONTRACTOR by the PURCHASER/ENGINEER and afford them every facility for the execution of their several functions simultaneously with his own.

25. TIME CONTROL

Program: Time is the essence of the contract. The contractor shall organize his resourcesand perform his works so as to complete the contract in the stipulated completion period.

The contractor shall execute the project as per completion period given in Schedule E. During the execution of the contract, if the Engineer opines that proper progress is not maintained, suitable changes shall be made in the balance program of works to ensure proper progress.

Progress of Work:

If it is found that the progress of work is not commensurate with the program of completion, APSPCL will be entitled to terminate the contract in part or full, giving 15 days notice and get the balance works / supplies completed through other agencies at the contractor's cost and risk. This right of APSPCL is in addition to levying of "Penalty" for delayed works. The contractor shall furnish a monthly statement for the quantity of material supplied, quantity consumed and balance quantity held with him to the Engineer-In-Charge/Ananthapuramu Ultra Mega Solar Park (1500 MW) concerned, with a copy marked to Chief Executive Officer, Tadeaplli.

26. MANAGEMENT /CO-ORDINATION MEETINGS

Monthly review of works shall be done by the Engineering-In-Charge and bi-monthly review meetings will be conducted by CEO/APSPCL. Warning letters will be issued by Executive Engineer/Technical if the progress is not satisfactory. If the progress continues to be poor even after the second warning letter, show cause notice will be issued which will be followed by stoppage of all payments to the contractor, encashment of the BGs, and termination of contract and the balance works / supplies shall be completed through alternateve agencies at contractor's risk and cost. The contractor so penalized shall be blacklisted for 3 years from the date of termination of contract.

Early Warning: The contractor has to intimate the APSPCL at the earliest opportunity of specific likely future events or circumstances, which may adversely affect the Project Implementation Schedule. The contractor shall cooperate with the officers of APSPCL in making and considering proposals for how the effect of such an event or circumstance can be avoided or reduced.

27. SITE STORES:

The contractor shall establish temporary stores at his cost at the sub-station site for storing material/equipment such as cement, steel, panels etc. This store should be dismantled and sitecleared after the completion of the work.

28. CONTRACTOR'S SITE OFFICE:

The CONTRACTOR shall establish a Site Office at the 'Site' and keep posted an authorized representative for the purpose of the 'Contract'. Any written order or instruction of the PURCHASER/ENGINEER or his duly authorized representative shall be communicated to theauthorized representative of the CONTRACTOR at the Site Office and the same shall be deemed to have been communicated to the CONTRACTOR at his legal address. A complete set of specifications, drawings and a copy of the contract agreement shall be kept in the siteoffice at all times.

29. CLEARING UP THE SITE:

During construction, the contractor shall keep the work site and storage area used by him freefrom accumulation of waste materials or rubbish and before completing the works the contractor shall, at his own cost, remove or dispose off in a manner satisfactory to the engineerin charge. All temporary structures waste and debris shall be cleaned, all holes in the groundshall be filled in and the land restored to its original state as far as is practicable and the entirepremises should be in a neat and tidy condition as directed by the Engineer. Any damage done to the permanent or temporary work of the Department by the contractor shall be madegood at contractor's expenses.

30. CHANGE ORDERS

The Purchaser may at any time by a written order given to the Contractor, make changeswithin general scope of the contract in any one or more of the following:

(a) Drawings, designs or specifications for material/equipment.
(b) Method of packing,
(c) The services to be provided by the contractor.

If any such change causes an increase or decrease in the cost of, or the time required for the material or works, an adequate adjustment shall be made to the contract price or delivery schedule or both and the contract shall be accordingly amended.

31. WATER & POWER: The successful bidder has to make use of the water and power supplyavailable if any at Substation site. Transport of water from the available source to the Sub- station site will be the bidder’s responsibility. The contractor has to use power driven equipment at his own cost for pumping water. In case water is not available at site the bidderhas to make his own arrangements and any extra claim on account of this will not be entertained. Temporary Power supply if required for construction purpose will be arranged byAPSPCL at one point in the substation site from DISCOM. Further cabling up to the contractor’s office/works is in the contractor’s scope only. It is the responsibility of the contractor:

a) The power consumption charges including deposits if any for temporary supply will have to be borne by the contractor.
b) To settle all the bills raised by DISCOM regarding the consumption charges and to obtain & submit “No Due Certificate” from DISCOM on completion/closing of works.
c) If any mal-practice/theft of energy takes place during the execution of contract bythe contractor, it is the responsibility of the contractor to settle such cases by DISCOM

before completion of substation works.

32. OPERATION AND MAINTENANCE MANUALS:

Contractor shall supply operation and Maintenance manuals at least one month prior to scheduled completion date. If the contractor does not supply the manuals by the date stated, the Purchaser shall with hold the amount suitable from payments due to the contractor.

15 copies of Contract Agreements, Purchase Order with specification, QAP, all the approved drawings of Equipment, Materials, GTPs, BOMs, Layout plans etc and Equipment manuals, technical literature, operating instructions etc., provided by the manufacturers shall be supplied by the bidder and to keep the spare records at Head Quarters. The cost of the above shall be borned by the Contractor.

33. SAFETY PLANS

I) <u>GENERAL SAFETY RULES FORMED FOR FOUNDATIONS, TOWER ERECTION ANDSTRINGING:</u>

1. Steel/ Aluminums /Wooden ladders of 3.5 meters length shall be used for movement of labour in excavation, stub setting and concreting works. Keep cement out of the eyes.
2. All polypropylene ropes and slings, shackles proposed to be used shall be tested and inspected thoroughly before use.
3. Walkie talkie sets & Cell Phones shall be used for effective communication.
4. Binoculars shall be used for closer view
5. Red and Green flags shall be used for illiterate communication.
6. Pilot wires and joints shall be tested and thoroughly inspected before use
7. Ropes and guy wires shall be tested and thoroughly inspected before use
8. To cross over of energized lines, the line clear permit system shall be followed without any ambiguity to de-energize the lines. The de-energized lines shall be earthed effectively. Men and material clearance on line shall be ensured before returning permit.

II) <u>GENERAL SITE SAFETY RULES & REGULATIONS</u>

1. All personals engaged for this job shall wear Safety Helmet & safety shoes.
2. Appropriate Hand Gloves shall be used for Materials handling, Welding, Grinding, Gascutting, Chemical Handling & Electrical work.
3. Suitable goggles must be ensured for the personnel deployed for Welding, Gas CuttingChipping etc Grinders shall use face shield.
4. The personnel engaged in the noise zone such as Compressor Operator, Pneumatic Vibrators & Breakers, DG Operator etc. shall be equipped with suitable ear protection.
5. All personal working over 2.0-meter height shall wear full body safety harness with double lanyard and scaffold hook, before climbing. Further he will have to anchor the safety harness to a fixed structure before starting the work at a height, Fall Arrest Devices will be used in conjunction with safety harness, wherever the requirement arises.
6. Smoking is prohibited in all restricted area except in authorized smoking areas/ shelters.

7. Horseplay is prohibited at workplace. Running at the site is prohibited, except in case ofemergency.
8. Material shall not be thrown from the height. It should be lowered from height.
9. Other than the electricians, no one is allowed to carry out electrical connections, repairs onelectrical equipment or other jobs related thereto.
10. Inserting of bare wires for tapping the power from electrical sockets is completely prohibited.
11. Electrical supply to portable equipments should be through Earth leakage circuit breaker(ELCB) of 30 milliamps sensitivity.
12. All major /minor accidents and near misses to be reported to Site in charge / Site Safety Engineer to enable the management to take necessary steps to avoid the recurrence.
13. All tools and tackles shall be inspected before use. Defects to be reported immediately. Nolifting tackle to be used unless it is certified by a competent person/ Safety Engineer.
14. Workers should possess induction tester. Whenever a shut down is taken this deviceshould be used to ensure no current is on the conductor.
15. Move carefully when walking or climbing.
16. Keep the working area as neat as possible.
17. Remove hazards as soon as they are noticed.

III) <u>ENERGIZED ELECTRICAL WORKS, BASIS REQUIREMENTS ARE:</u>

1. Face shields/ Voltage rated gloves/ Voltage rated rubber floor matting Shepherd's Hook/Warning/ Safety signs/ barricades.
2. Pay close attention to what is being done.
3. Disconnect power tools before adjusting them.
4. Keep power tool guards in place.
5. Avoid interrupting another person who is using a power tool.

IV) <u>STORES</u>

1. A layout demarcating areas for stacking, storing and disposing the materials is made.
2. The materials are stacked with passage to reach them. The aisle is marked. Materialsshould not protrude beyond the marked area posing tripping hazard.
3. Name boards shall be displayed to mention the place for every item.
4. The racks installed must be supported well to prevent from falling.
5. To reach the rack top, person should not climb on the rack shelf, ladder should be used.
6. Vertical stacking of materials should not exceed the prescribed norms, posing fallinghazard because of imbalance.
7. Adequate lighting is provided.
8. Flammable, materials like Dissolved acetylene, paints etc. are stored under well-ventilated shed. Electrical connection in these locations should be proper and maintained well such that they do not cause short circuit. Smoking, carrying matchbox or any other fire causing materials is prohibited in these areas.
9. Sufficient fire extinguishers are kept at conspicuous places and the path to reach them shall not be blocked anytime.
10. Toxic materials are labeled and kept at secured place where only authorized persons shall handle.
11. Nail pullers shall be used whenever possible to remove nails from boxes and crates.

Metal strapping should be cut with proper safety tool.

12. Barrels and drums shall preferably be placed on one end. If placed on their side, these shall be provided with racks or blocked so these cannot roll.
13. Oils, greases and paints shall not be openly stored at any time.
14. The scrap pile and junk materials shall be kept as orderly as conditions will permit. Extremecare shall be used in handling scrap material to prevent personal injury.
15. All T&P issued to the site to be ensured in safe working conditions by a competent personand damaged T&P to be identified and place at a marked place.
16. First aid box shall be available at work site.

V) TRANSPORTATION OF MATERIALS

1. Only identified crew does the loading and unloading of the materials.
2. The gang leader and the crew should be aware of the weight of the materials they are tohandle.
3. Proper and reliable tackles like slings, D- shackles etc. shall be used for material handling.
4. Lashing to be done after the materials loaded on the trailer.
5. Red flag is tide on structures extending beyond the trailer body. At night reflectors to befixed.
6. Structures extending beyond the cabin height are prohibited from transporting.
7. The driver should be aware of the path to the terminal he is to transport the material andensure on blockaded are there.
8. The gang leader should know the specific spot for unloading the materials.
9. Two tag lines shall be tide to the end of the structures while handling by crane.
10. All structural steel shall be placed on wooden sleepers.
11. Stable and sufficient wooden sleepers to be ensured by the Foreman /gang leader.
12. Workmen should not travel along with the loaded material.
13. It is better to plan material shifting in sequence in such a manner that one gang is engaged for loading and another gang should be made available for unloading. This will reduce the traveling of workmen on transport vehicles.
14. The supplier/Manufacturer shall provide such packing for the material/equipment as is required to prevent their damage or deterioration during transit to their final destination as indicated in the Technical specification for material/equipment. The packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, humidity etc. during transit and open storage.

VI) SAFETY SIGNS

1. Safety warning signs shall be placed to provide adequate warning of hazards. Sign shall beremoved or covered when the hazards no longer exist.
2. Warning signs shall indicate the cautions to be observed regarding the hazards concernedand the necessary information and, also, actions of employees required to initiate.
3. It is recommended that safety signs on the Project conform with the current national colourcodes.
4. Signs shall be in English & Local language where located near public highways and facilities.
5. Sign required to be seen at night shall be illuminated. Kerosene and open flame pots shall not be used for illumination.

34. BILL OF MATERIALS: Wherever the drawings and designs are provided by APSPCL, the suitability of these designs and drawings shall be verified by the bidder for design

requirements as per standards, site and soil conditions based on the soil investigation and environmental conditions prevailing for that particular project before submitting BOMs for approval. Substitutions if any of steel sections of the tower parts of higher size due to non-availability or other wise, shall be to the contractors account. The supplier shall raise the invoices as per the approved BOMs.

35. MEASUREMENT OF WORK AND PROGRESS PAYMENTS

The PURCHASER/ENGINEER may, from time to time, intimate the CONTRACTOR that he requires the works to be measured and the CONTRACTOR shall attend or send a qualified agent to assist the PURCHASER/ENGINEER or his representative in taking such measurements and calculations and to furnish all particulars as may be required by him.

Where the erection of equipment, vessels and structural steel is involved, the basis of such measurements and progress evaluation shall be weights specified in the bidding documents or invoices or drawings as decided by the PURCHASER/ ENGINEER.
Should the CONTRACTOR not attend or neglect or omit to send such agents, then, the measurement taken by the PURCHASER/ENGINEER or approved by him shall be taken to be the correct measurements of the work. The CONTRACTOR or his agent may, at the time of measurement, take such notes of measurements as he may require.
When measurements are affected by conditions already established, the CONTRACTOR shall take field measurements notwithstanding scale or dimensions shown on the drawings.
The measurements so taken and certified correct by the PURCHASER/ENGINEER shall be the basis for the progress payment to the CONTRACTOR. Where the breakup of 'Contract on unit basis price' is difficult to arrive at, the PURCHASER/ENGINEER and the CONTRACTOR shall work out at the commencement of the 'Contract', the weightages or the cost break-ups to arrive at a mutually agreeable basis for computation of the progress estimates.

To the value so arrived at on the basis of the CONTRACTOR's monthly progress evaluated, shall be added the amounts earned by the CONTRACTOR under supplemental contracts and orders, if any, till date of progress estimate. From the total thus computed, all previous payments plus any amounts due to the PURCHASER in accordance with the terms of this contract shall be deducted. The remainder shall be paid by the PURCHASER to the CONTRACTOR under interim Certificates from the ENGINEER.

In case of work is nearly suspended, or in case only unimportant progress is being made, or in case it is apparent that the CONTRACTOR is about to forfeit his 'Contract' or that the money yet due to him shall not complete his 'Contract', the PURCHASER may at his discretion withhold any payment which may be due to the CONTRACTOR.

The PURCHASER may withhold part or whole of any payment for erection claimed by the CONTRACTOR, which in opinion of the PURCHASER, is necessary to protect himself from loss on account of:

a) Defective work not remedied or guarantees not met
b) Claims filed against the CONTRACTOR
c) Failure by the CONTRACTOR to make due payment for materials supplied or labour employed by him.

d) Damage to other Contractor's, PURCHASER's or OTHERS' property.
e) Failure to meet the mutually agreed schedules for completion of the contract.

When the grounds for withholding payments are removed, payments of the amount due to the CONTRACTOR shall be made by the PURCHASER without delay.

The CONTRACTOR shall not demand nor be entitled to receive payment for the work or portion thereof, except in the manner set forth in this 'Contract' and only after the PURCHASER/ ENGINEER shall have given a certificate for such payment.

36. PROTECTION OF WORK:

The CONTRACTOR shall have total responsibility for protecting his 'Works' till it is finally accepted by the PURCHASER/ ENGINEER. No claim will be entertained by the PURCHASER/ ENGINEER for any damage or loss to the CONTRACTOR's works and the CONTRACTOR shall be responsible for the complete restoration of the damaged 'Works' to its original condition to comply with the specifications and drawings. If any such damage occur to the CONTRACTOR's Works because of other party not under his claim directly with the party concerned the same shall be dealt by the contractor alone. During construction of the project, the PURCHASER will continue to operate the plant and equipment already put in service. The CONTRACTOR shall protect all such plant, structures, piping, conduits, equipment and facilities against damage during its operations.

37. FIRE PROTECTION

The Work procedures that are to be used during the erection shall be those, which minimize fire hazards to the extent practicable. Combustible materials, combustible waste and rubbish shall be collected and removed from the 'Site'. Fuels, oils and volatile or inflammable materials shall be stored away from the construction and equipment and materials, storage areas, in safe containers. Untreated canvas paper, plastic or other inflammable flexible materials shall not at all be used at 'Site' for any other purposes unless otherwise specified. If any such materials are received with the equipment at the 'Site', the same shall be removed and replaced with acceptable material before moving into the construction area or storage.
Similarly, corrugated paper fabricated cartons, etc., will not be permitted in the construction area either for storage or for handling of materials. All such materials used shall be of waterproof and flame-resistant type. All the other materials such as working drawings, plans, etc., which are combustible but are essential for the 'Works' to be executed shall be protected against fire resulting from welding sparks, cutting flames and other similar fire sources.

All the CONTRACTOR's supervisory personnel and sufficient number of workers shall be trained for fire fighting and shall be assigned specific fire protection duties. Adequate number of such trained personnel must be available at the 'Site' during the entire period of the 'Contract'.
The CONTRACTOR shall provide and maintain fire protection equipment, adequate in design and numbers for the warehouses, office, temporary structures etc. Access to such fire protection equipment shall be easy and kept open at all times. The compliance of the

above requirements under fire protection shall in no way relieve the CONTRACTOR of any of his responsibilities and liabilities due to fire accidents occurring either to his materials and equipment or to those of others working in the area.

38. SECURITY (WATCH & WARD)

The CONTRACTOR shall have total responsibility for all equipment and materials in his custody stored, loose, semi-assembled and/or erected by him at 'Site'. The CONTRACTOR shall make suitable security arrangements including employment of security personnel to ensure the protection of all materials, equipment and 'Works' from theft, fire, pilferage and any other damage and loss.

39. TESTING AND COMMISSIONING

The MRT wing of APTRANSCO/APSPCL supervises and assists the Contractor and his sub-vendors in testing & commissioning of Equipment. However the 'Testing and Commissioning' of the equipment erected by the CONTRACTOR shall be the responsibility of the CONTRACTOR. The CONTRACTOR shall provide in addition, test instruments, calibrating devices, etc. which are not available with MRT wing for successful and speedy completion of testing and commissioning. The labour required for the successful performance of these inspection tests shall have to be arranged by the Contractor. If it is anticipated that the above tests may prolong for a long time, the CONTRACTOR's workmen required for the above inspection tests shall always be present at 'Site' during such inspection tests. All the expenditure for the above arrangements will be to the contractor's account only.

40. INDEMNITY BOND FOR ALL MATERIALS: For all materials supplied by the Contractor, the Contractor shall take delivery of materials after executing an indemnity bond in favour of the Purchaser against loss, damage and any risks involved, for the full value of the materials. This indemnity bond shall be valid till the scheduled date of testing, commissioning and handing over of the Augmentation to the Purchaser.

41. ACCOUNTING OF SURPLUS MATERIALS/ SETTLEMENT OF MATERIAL ACCOUNT: On completion of the works, all surplus materials, and the dismantled structures, conductorscrap, MS Scrap, cable scrap etc for which payments have been made by the APSPCL, shall be handed over to the Engineer at APSPCL s designated stores at the cost of the contractor within a time limit of 1 month. If the materials are not returned and are in the opinion of the Executive Engineer in-charge of the work, not in a fit condition for use, they will be treated as sold to the contractor at DOUBLE the rate of issue of material and recoveries made contractor's bill accordingly.

42. FINAL ACCOUNT:

a) Not later than two (2) months after handing over of the works complete in all respects i.e., after successful testing and commissioning, the Contractor shall submit a draft statement of 'final account' and supporting document to the Engineer/Engineer's Representative showing in detail the value of the work done in accordance with the contract.

b) Within two (2) months after receipt of the Draft Final Account and all information

reasonably required for its verification, the Engineer/Engineer's representative shall determine the value of all matters to which the Contractor is entitled to under the contract. The Engineer/Engineer's representative shall then issue to the Contractor a statement showing the final amount to which the Contractor is entitled to underthe contract. The Contractor shall sign the Final Account as an acknowledgement of the full and final value of the work performed under the contract and shall promptly submit a signed copy to the Engineer/Engineer's representative.

c) On receipt of Final Account, the Engineer/Engineer's representative shall promptly prepare and issue to the Contractor a "Final Payment Certificate" certifying any further amounts due to the Contractor in respect of the contract.

d) If the contractor does not finalize the material account within 6 months from the date of completion of works/ handing over of works, the field Divisional Engineer will prepare the final bill duly deducting the cost of all the unaccounted / unhanded over material and will issue a notice to the contractor for signing on the bill. If the contractor do not turn-up within 15 days of that notice, the bill will be processed without signatures of the contractor. The cost of the unaccounted material will be taken as per Clause 42 above.

43. TAKING OVER:

Upon successful completion of all the commissioning tests to be performed at site on equipment furnished and erected by the Bidder, and on successful commissioning of the project, the Purchaser shall issue to the Contractor 'a taking over Certificate' as a proof of the final acceptance of the project. However, such taking over certificate will be issued only after handing over of all the manuals, drawings, tower schedules as per Clause 32 above and after settlement of materials account and final bill.

TECHNICAL SPECIFICATION OF WORKS

TECHNICAL

PART- II (A)

1.0 SCOPE

The works include:

1.1 WORKS IN THE SWITCHYARD

i) Excavation for main and equipment structure foundations, plinths for Transformers, gate pillars, levelling, cable laying, earthing etc.

ii) RCC/CC foundations for structures, Transformer and circuit breaker plinths etc.

iii) Back filling for foundations

iv) Levelling of sub-station site with borrowed gravel or excavated earth including clearingof site.

v) Construction of cable duct including cable ducts crossing Transformer track

vi) Spreading of HBG metal

1.2 CONSTRUCTION OF CONTROL HOUSE

The work involves excavation and laying of foundations, construction of super structure, laying RCC slab, providing doors, windows, flooring with ceramic tiles, painting, providing water supply and sanitary arrangements etc., including electrification of control house.

1.3 ERECTION WORKS

i) Erection of main and auxiliary structures including supply of raw steel, fabrication and galvanization of structures and equipment including panels.

ii) Erection of all substation/bay equipment including Panels, Capacitor Banks etc., but excluding Power Transformers.

iii) Stringing of bus bars, jumpering, connections between equipment, buses, etc.

iv) Stringing of ground wire

v) Earthing system including laying of C.I. pipes and B.H. coke for earth pits

vi) Cable laying and terminations including erection of marshalling kiosk/ boxes.

vii) Yard illumination, firefighting etc.

1.4 ELECTRIFICATION OF CONTROL HOUSE (Two storied Building):

The work involves electrification of control house including supply of all the materials, wiring etc.

2.0 TYPE OF CONSTRUCTION

The sub-station structures shall be lattice type galvanized structures. The foundations of 220KV main structures are stub type and other structures are foundation bolt type. The 220KV bus is strung with MOOSE ACSR conductor and, 33KV buses are strungwith ZEBRA ACSR conductor. A control house to locate panels, battery, battery charger and D.C distribution board is to be constructed as indicated in Clause 1.2 above.

2.1 DRAWINGS

The following drawings are enclosed to give an idea about the work involved :

i) Control house plan, foundation details, Reinforcement details of columns, beams, roof, Details of Doors and windows, Electrification of control house, cable duct in control house etc.
ii) Cable duct in switchyard, cable duct at road crossing points.
iii) Earth mat details
iv) Main gate and wicket gate
v) Foundation and structural drawings
vi) Retaining wall

3.0 CODES AND STANDARDS

All equipment materials fabrication galvanizing and tests shall conform to the latest applicable standards, codes etc. mentioned here in or to equivalent applicable international standardsapproved by the engineer

Sl.No.	STANDARD	TITLE
1	IS 8112/1989	43 grade ordinary Portland cement
2	IS 1786/1985	High strength deformed steel bars and wires for concrete reinforcement
3	IS 456/1978	Code of practice for plain and reinforced Concrete
4	IS 383/1970	Course and fine aggregates from naturalsources for concrete
5	IS 2062/1992	Steel for general structural purposes
6	IS 432 (Part-1& Part-2) /1982	Mild steel and medium tensile steel bars and hard drawn steel wire for concrete reinforcement.
7	IS 12427/1988	Transmission Tower Bolts
8	IS 1367 (part II)	Technical supply conditions for threaded steel fasteners - Product grade and tolerances
9	IS 1363 (part III)	Hexagon Nuts (size range M5 to M64)
10	IS3063/1994	Fastners - single coil rectangular sectionspring

		washers
11	IS2629/1985	Recommended practice for Hot dip galvanizing on Iron& Steel
12	IS4759/1984	Hot dip Zinc coatings on structural steel andallied products
13	IS7181/1986	Horizontally C.I double flanged pipes for water, gas and sewage valve fittings for compressed gas
14	IS3224/1979	Cylinders excluding liquified petroleum gascylinders
15	IS2026	Station Transformer
16	IS5039/1983	Distribution pillars for voltages notexceeding 1000 volts
17	IS4072/1975	Steel for spring washers
18	IS1573/1986	Electroplated Coatings of Zinc on Iron &Steel
19	IS2202(Part-I)/1991	Wooden flush door shutters
20	IS4351/1976	Specification for steel Door frames
21	IS513/1994	Cold rolled low carbon steel sheets and strips
22	IS617/1975	Aluminum and aluminum alloy in gots and casting for general engineering purpose.
23	IS5561/1970	Electric Power Connectors
24	IS486 (Part-I)/1993	Metal fittings of insulators for overhead power lines with normal voltage greater than 1000 V – General requirements & Tests
25	IS2486 (Part-2)/1989	Insulator fittings for overhead power lines with a nominal voltage greater than 1000V – Dimensional requirements
26	IS2108/1977	Blackheart malleable iron castings.
27	IS2486/	Hardware fittings, clamps and connectors
28	IS4984	P.V.C. Pipes
29	APSS	Andhra Pradesh Standard Specification

4.0 CLIMATIC & ISOCERAUNIC CONDITIONS

The climatic and isoceraunic conditions where the sub-station work/bay extensions are carriedout are as given below:

i.	Altitude	:	(+) 430 m EL above mean sea level
ii.	Climate	:	Tropical-Hot-Humid
iii.	Ambient Temperature (Dry Bulb)		
	a) Daily maximum (Mean)	:	33.0 Deg. C
	b) Daily minimum (Mean)	:	25.0 Deg. C
iv.	Relative Humidity		
	a) Maximum Humidity	:	64 percent
	b) Minimum Humidity	:	35 percent
	c) Average Humidity	:	49 percent
v.	Rainfall		
	a) Maximum intensity	:	60 mm per Hour
	b) Annual Average	:	560 mm
	c) Tropical monsoon	:	June to October
vi.	Wind Velocity & Pressure (As per IS: 875-1987 Part III)		
	Basic Wind Speed	:	50 m/sec
vii.	Seismic Zone	:	Zone II as per IS: 1893-2002

5.0 COMPLIANCE WITH REGULATIONS

Unless otherwise specified works shall be carried out in accordance with the Indian ElectricityAct. 2003, Indian Electricity Rules 1956 or any other revisions thereof which may be issued during the currency of the contract and the requirements of any other regulations and Acts inIndia to which the employer may be subjected to.

5.1 The contractor himself has to arrange for the permits required for the operation of the vehiclesused in construction works and such other permits not being arranged by the employer/Engineer.

6.0 MATERIALS TO BE PROCURED BY THE CONTRACTOR AND TESTING:

The materials required for the work are to be procured by the contractor. The materials suchas galvanized structures, Clamps, Earth flats, Bolts and nuts, conductor which are procured by the contractor should be got tested by the APSPCL official. No material should be used without the approval of APSPCL. **The complete technical and other**

particulars will be intimated to the successful bidder after his bid is accepted. The contractor shall be fully responsible for the proper handling, maintenance and safe custody of the materials given to him or his authorized representative at the employer's stores for erection from the time of taking over till the complete sub-station/bay extension is taken over by the employer.

6.1 SURPLUS MATERIALS

On completion of works all materials left surplus from those supplied under the contract for erection shall be handed over to the employer at the employer's stores in good condition. The contractor shall furnish a statement giving full details of all materials received from the employer, quantities utilized on works (based on the drawings given to him) and the balance returned to the employer and obtain a clearance certificate from the Executive Engineer, within one month after completion and handing over of the substation/bay extension. It may be noted that returning of all materials and rendering of accounts for the materials received is a pre-condition for release of payment against final bill and also the deposit towards performance at a later date.

6.2 REPLACEMENT

In the event of the material handed over to the contractor for the execution of this contract being lost, damaged or destroyed while being in the custody of the contractor before being taken over by the employer, the contractor shall be liable to make good the loss. In case the contractor fails to return the balance surplus materials, the cost of materials will be recovered from the contractor's bills in accordance with the provisions in employer's Commercial Accounts Manual.

7.0 MATERIALS REQUIRED FOR THE WORK

The requisite quantities of materials specified in Appendix-II (enclosed) required for the completion of bay extensions. If additional quantities of materials (in excess of those to be issued as per contract) become necessary due to damage or loss on account of mishandling and negligence of the contractor to complete the work, the contractor shall requisition such quantities duly explaining the circumstances under which the additional quantity has become necessary. The contractor will be responsible for the proper handling and maintenance of the materials from the time of receipt by him up to the time of handing over of the completed works to the employer and return of surplus material if any, at the employer's stores. The cost of such handling and storage shall be covered in the quoted prices detailed in bill of quantities. On completion of the works all surplus materials shall be handed over to the engineer at the employer's stores. This shall be done with in a maximum period of one month after completion and handing over of the sub-station/bay extension works. If the materials are not returned within this period and/or in the opinion of the engineer are not in a fit condition for use, such surplus materials will be treated as sold to the contractor at the rate calculated in accordance with the provisions in employer's commercial accounts manual and recoveries made accordingly. The retention amount against the contract will be released only after all the balance materials are handed over at employer's stores in proper shape and material accounts are rendered.

8.0 SUPPLEMENTAL ITEMS:

8.1 The quantities indicated in the schedule of the prices are only provisional and are

likely to change during actual execution. When quantities of work of any item are likely to exceed thescheduled quantity, the Contractor shall bring the fact to the notice of APSPCL three weeks in advance and take orders for going ahead with the work. Without approval of this office, the Contractor shall not go ahead with the work wherever there is increase in quantities.

8.2 The contractor is bound to execute all supplemental items that are found essential, incidental and inevitable during execution of main works, at the rates to be worked out as detailed below:

(a) Supplemental items directly deducible from similar items in the original agreement:The rates shall be derived by adding to or subtracting from the agreement rates of such similar items, the cost of the difference in quantity of material or labour between new item and the similar item in the agreement worked outwith reference to the schedule of rates adopted in the sanctioned estimate with which the tenders were compared plus or minus overall tender percentage.

(b) New Items:

(i) Similar items the rates for which cannot be directly deduced from the original/agreement.

(ii) Purely new item which do not correspond to / any item in the agreement. The rate shall be estimate rate plus or minus overall tender percentage.

NOTE: The term estimate rate used in (i) and (ii) above means the rate corresponding to the respective item in the sanctioned estimate whose value is shown in the Schedule – A while calling for the tenders for the work or if no such rate is available in the estimate, the rate derived with referenceto the schedule of rates adopted in the sanctioned estimate.

(c) Addition of provision towards importation of labour, labour amenities, dewatering etc., in working out supplemental items.

If the new item is in substitution of an old item which allowed for importation of labour, labour amenities, dewatering etc. Those factors may be taken into account in computing the substituted items also at the same rates at which they were originally provided.

In respect of the new items the case has to be considered on its merits and provisionfor importation of labour, labour amenities, dewatering etc., has to be fully justified.

(d) Execution of items of work in excess of quantities in Schedule 'A' , bill of quantities of tender:

The rates quoted by the tenderer shall hold good irrespective of quantities given in bill of quantities. However, for quantities exceeding 25% over those given in Bill of Quantities, approval of competent authority shall be obtained before

executing such quantities against those items**.**

9.0 CLEARING-UP THE SITE:

During construction the contractor shall keep the work site and storage area used by him freefrom accumulation of waste materials or rubbish and before completing the works the contractor shall, at his own cost, remove or dispose off in a manner satisfactory to the engineer in-charge. All temporary structures, waste and debris shall be cleaned, all holes inthe ground shall be filled in and the land restored to its original state as far as practicable andthe entire premises should be in a neat and tidy condition of cleanliness as the Engineer maydirect. Any damage done to the permanent or temporary work of the Department by the contractor or his sub-contractor shall be made good at contractor's expenses.

10.0 SITE STORES:

The successful bidder shall establish a temporary store at his cost at the sub-station site forstoring cement, equipment such as panels etc. This store should be dismantled and site cleared after the work is completed by him.

11.0 SITE CONDITIONS:

The bidder is expected to familiarize with the site conditions and facilities available before quoting. Regarding water supply and electric power supply arrangements, Clause 16 of part-II of technical specification is applicable.

12.0 LEVELLING:

Substation switchyard should be leveled as per directions of Engineer with the surplus earthleft over after back filling structure foundations. If surplus earth is not adequate for levelling, the levelling should be done by excavating earth in any portion of substation site whatever type of soil is met with and filling should be done with such earth for levelling switchyard. If thisis not sufficient, the switchyard is to be leveled by supplying gravel from the approved borrowed areas. Clearing of the entire site by removing bushes, hedges, unwanted plant growth and other things are in the scope of levelling work. The work shall be carried out as perIS 301,302 and 138.

COMPACTION: Compaction shall be achieved by the use of smooth wheeled rollers, pneumatic type rollers, sheep's foot rollers, vibrating plates, frog rammers, power rammers and such other equipment as shall be specified. Compaction shall be carried out on each layer of thickness not more than 600 mm. Density tests shall be made on each compacted layer and the density attained shall not be less than 95% of maximum dry density (standard proctor for the type of material used). A record of the density tests conducted on each layershall be recorded in a register maintained by field staff.

12.1 ANTI WEED TREATMENT AND ANTI TERMITE TREATMENT:-

Anti weed treatment and anti termite treatment for excavation in the site shall be done as perTechnical Specification.

13.0 EXCAVATION & FOUNDATIONS FOR STRUCTURES:

These shall be as per drawing for structure foundations and as per the Technical specifications for excavation, CC/RCC, Back filling etc. The scope of work is detailed

here under.

13.1 FOUNDATION EXCAVATION:

Earth excavation has to be done in all types of soils which can be excavated with pick axe & crow bars in all conditions such as dry, wet, slushy etc., and in hard rock requiring controlled blasting including shoring, shuttering and dewatering wherever necessary covering initial lead and lift. Back filling the foundations with excavated earth after laying the foundations.

13.2 FOUNDATION CONCRETE:

Laying foundation for main and auxiliary structures, transformer plinths etc., including dewatering the pits before and during the process of laying concrete in the proportion of RCC 1:2:4 using 20mm HBG metal and CC 1:4:8 using 40mm HBG metal as per the drawings forstructural foundations enclosed to the specification and curing for 14 days including cost of cement, reinforcement steel.

13.3 BACK FILLING: This item included in the foundation excavation

Back filling of foundations with excavated soils including watering and consolidating in 300 mm layers and consolidated upto 95% proctor density for normal soils. Providing sand cushion for foundations and flooring area including cost of sand, watering and consolidationupto standard specifications for BC soils.

13.4 PLASTERING:

Plastering foundation plinths 12mm thick in (1:3) cement mortar and white washing (two coats) with Janatacem cement paint. All projections of plinths and masonry above ground level shall also be provided with Janatacem cement paint.

14.0 CABLE DUCT:

14.1 CABLE DUCT IN SWITCHYARD:

The cable duct in the switchyard shall be constructed as per drawing no. SE/T(SS) 1/99. It comprises of 230mm thick brick work in cement mortar (1:6) on either sides. The depth andwidth of the duct shall be 500mm and 960mm respectively. Cables are to be buried in sand in this duct over CC (1:4:8) with 40mm HBG metal bed of 100mm thick. The cable duct shall becovered with a RCC slab of size 790mmX500mmX50mm thick of proportion 1:2:4 with 12 to20mm HBG metal with 8mm tor steel placed along shorter span @ 100mm c/c and 6mm MS rods placed along longer span @ 150mm c/c with suitable lifting hooks (2 Nos.) with 8mm torsteel. The cable duct cover slab shall be in flush with the top of the brick work. Plastering to side walls shall be done in CM(1:3) for inner face and upto 10 Cm below G.L on outer face. The work to be executed shall conform to the technical specification as given in the Part-B oftechnical specification.

14.2 CABLE DUCT AT ROAD CROSSINGS:

Cable duct of width 1150mm and 900mm depth by providing 300mm dia RCC Hume pipe (plain ended pipe)& collars required confirming to BIS 458/1988 NP2 class as per drawing in two rows duly embedded in cement concrete (1:3:6) with 50% of 40mm HBG metal and 50% of 20 mm HBG metal shall be constructed as per approved drawing. Rate quoted shall include cost of cement, RCC Hume pipes and other materials and labour charges. Length of duct shall be constructed as directed by the Engineer in charge.

14.3 CABLE DUCT IN CONTROL ROOM:

Cable duct is to be constructed as per the approved drawing No. 2/2004 at lintel levels as perinstructions of engineer in charge at site. G.I. Weld mesh cable trays of 300mm width and 3 meters long with 25mmx25mmx4mm angle frames to be procured by contractor and placed inthe duct. These cable trays are to be supported on Galvanized M.S. Angles of 45 x 45 x 5mm to be procured by the contractor, and fixed in the cable duct as per the drawing. Cable duct will be covered with 7 mm Galvanized chequred plate to be supplied by the contractor. The main cable trenches entering at control room should be sealed for not to enter any creatures.

15.0 PROCUREMENT OF STEEL, FABRICATION, GALVANISATION AND SUPPLY OF STEELSTRUCTURES:

Procurement of steel such as MS angles, plates, Channels and M.S Rounds required for fabrication of structures is within the scope of contract. The structures shall be fabricated asper the structural drawings and galvanized. The structural drawings & bill ofmaterial will be issued by APSPCL. The technical specifications for procurement of steel. fabrication and galvanization of structures of technical specification. Galvanised bolts, nuts, pack and spring washers required for the assembly ofthe fabricated pieces to form into a composite structure of standard quality shall be supplied by the contractor. The 'U' bolts for Bus stringing and foundation bolts for main and/or auxiliary structures are also to be fabricated and galvanised by the contractor. The Galvanised nuts required for these bolts are also to be procured and supplied by the contractor.

16.0 ERECTION OF STRUCTURES :

The Structures shall be erected by piece-meal method on the foundations, after allowing the required curing time for the foundations. The members shall not be strained or bent during the course of erection. Care shall be taken to see that the jointing surfaces are clean and free from dirt or grit and fit properly. The structures shall be erected strictly in accordance with the approved drawings. After erection of structures the bolts shall be checked to ascertain that all nuts are fully tight. The contractor shall ensure that none of the bolts are left out. The structures must be truly vertical after erection and no straining will be permitted to bring them to vertical position. The tolerance allowed for verticality is 1 in 360 structure height.

17.0 STRINGING OF BUSBAR & GROUND WIRE :

17.1 The 220 kV bus will be formed with single/Twin/ Quadruple Moose/Zebra ACSR conductor and 33 kV buses will be formed with single/Twin Zebra ACSR conductor and shall be strung to required tension as per site Engineer's direction and as per switchyard layout drawing.

17.2 The stringing of bus conductors covers installation of tension insulator strings, suspension insulator strings, post type insulator stacks and other accessories alongwith tensioning of conductor and clamps. The jumpering to various equipment and the ground wire stringing are also under the scope of this work. The G.I. Ground wire shall be strung as detailed in the layout drawing.

17.3 The insulator strings shall be assembled on the ground. These shall be cleaned, and examined before hoisting. All the parts including current carrying parts shall be clean without grease, paint and dirt. Insulators with cracks or chips or those having glazing defects exceeding 0.5 Sq. Cm shall not be used.

17.4 The sag of bus conductor shall not be more than 1%. Damaged conductors shall not be used. No joints are to be made. The conductor surface shall be clean and smooth without any projections, sharp points, cuts or abrasions, etc., and the conductor shall be continuous in span.

18.0 EARTHING SYSTEM:

18.1 The M.S.Flat of sizes 100x16mm and 75x8mm confirming to IS 2062 shall be procured by the successful bidder. The earth mat shall be as per the drawing No. SETSS 1/99 and extend over the entire switchyard. The earth mat shall be formed with the steel flats buried in the ground at a depth of 500 mm on edge. G.I. wire shall be used to connect the overhead ground wires to the ground mat, along the structures at all the locations.

18.2 All the junctions of the steel flats while forming the earth mat and taking risers from the earth mat for giving earth connections to equipment, steel structures, conduits cable sheaths shall be properly welded. All joints shall be provided with suitable angle pieces for proper contact between Two flats

18.3 Provisions shall be made for thermal expansion of the steel flats by giving smooth circular bends, as per the sketch shown in the earth mat layout. Bending shall not cause any fatigue in the material of bends.

18.4 The earth mat shall be formed by welding 75 x 8 mm steel flat to the 100 x 16 mm peripheral earth conductor. The grounding grid shall be spaced about 5 meters, in longitude and about 5 meters in the transverse directions and the contractor shall be guided by the same and the advice of the Engineer. After completion of earth mat, the earth resistivity may be measured. In case the earth resistance is more than one ohm, earth mat may be extended extra electrodes is installed so that the earth resistance is less than one Ohm.

18.5 All fence corner posts and gate posts shall be connected to the ground by providing 32 mm dia M.S. Rods of 3 meter length near the posts and connected to the main grounding mat.

18.6 All paint, enamel and scale shall be removed from surface of contact in metal surface beforemaking ground connection.

18.7 Earth flat is to be aligned along the main structure supporting structure for the equipment. The risers taken along the main switchyard structures and equipment structures (upto their top) shall be clamped to the structures at an interval of not more than one metre. The risers overthe ground level shall be galvanised. All other items of steel coming over the ground and exposed to atmosphere shall also be galvanised. Welded joints shall be painted with zinc richepoxy paint the cost towards this shall be included in the respective main items.

18.8 75 x 8 mm (flat) ground conductor shall be run in cable routes and shall be connected to the ground mat at an interval of 10 metres.

18.9 Grounding electrodes of 32mm dia 3mtr. Long M.S. rods shall be provided at the peripheral corners of the earth mat. The grounding rods shall be driven into the ground and their tops shall be welded to a clamp and the clamp together with the grounding rods shall be welded to the ground mat.

18.10 Lightning arrestors shall be provided with earth pits near them for earthing (as per the standard practice). Cast iron pipes 125mm in dia, 2.75 metres long and 9.5 mm thick weighing 94.84 kg and confirming to IS:7181/1974 shall be buried vertically in the pits andfinely broken coke, shall be filled atleast 150 mm around the pipe for the entire depth. Where it is not possible to go to a depth of 2.75 metres,1.3 x 1.3 M M.S plates, 25mm thick shall be buried vertically in pit of 2 metres depth and surrounded by finely broken cokeatleast 2 metre away from any building or structure foundation. The plates shall be atleast 15metres apart. These earth pits in turn shall be connected to the earth mat. Earth pits are to beprovided with RCC collars of 750 mm outer diameter, 50 mm thick and 600 mm height.

18.11 The joints and tap offs when welding is done shall be given a coat of Bitumen paints and thencovered with hessian tape to avoid rusting.

19.0 LAYING OF CABLES:

19.1 This section covers laying of cables, in cable trenches, cable ducts in switch yard, control room (two storied building) etc, cable jointing, termination at both ends and testing of the complete cable installation. At the existing substations where there is no cable duct in the switchyard the cables shall be buried in the sand in the ground after digging trenches of 300mm deep,300mm width and these trenches shall be filled with sand. The trench shall be levelled to the formation level of the yard. The cable route length is indicated in the annexureto the schedule of quantities. The cable route is to be marked at regular intervals of 10M byproviding cable route marking pegs.

19.2 The control cables will be copper wires of 2.5 sq.mm with number of cores being 2,4,6,10 or 12. Aluminum cables (2,4,6 cores) of 4 sq.mm shall be used as per the

directions. Threeand half core aluminum power cable shall be used for yard lighting and A.C. supply to equipment. Co-axial cable supplied by the employer for PLCC has to be laid.

19.3 The cable schedules will be provided to the contractor by the Engineer. The cable laying shallbe done strictly in accordance with these schedules The length of each cable issued shall be judiciously cut minimizing the wastage as per approval of Engineer.

19.4 All the electric equipment is to be set in place and aligned. Contractor shall provide power and auxiliary connection to the equipment and shall work in cooperation with suppliers representative in obtaining correct direction of rotation and commissioning of the equipment. Cable laying shall also include termination of cables i.e. at both ends of cable of equipment switchgear, control and protection panels, etc., as well as equipment to marshalling boxesand marshalling boxes to switcher panels.

19.5 Secondary terminals of CTs/CVTs/PTs shall be connected to marshalling boxes throughcables and then further connected up by cables panels or other equipment.

19.6 Cable lugs and ferrules shall be provided by the contractor. Dressing/bunching of all individual cores of thecables shall be done in a neat fashion. The contractor shall drill holes suitable for the cablesin cable gland plate.

19.7 Cable lugs shall be compressed on the conductor ends by means of tools. Insulating sleevesshall be furnished and covered over the bare ends of the connections so as to prevent accidental contact with the ground or with the adjacent terminals.

19.8 The insulating sleeve shall be fire resistant, and long enough to over pass the conductor insulation and shall be of correct size of the conductor used.

19.9 Cables entering the control room from out door areas shall be sealed. Spare glands shall besealed for control panels and some marshalling boxes.

19.10 Standard cable grips and seals shall be utilised for cable pulling after pulling cable, the contractor shall put and attach aluminum cable markers at both ends of the cables and at the control room entry. The cable number and other data shall be punched and the cablemarkers are to be securely attached to the cables.

19.11 Normally cable shall not be jointed for deviation, the approval of the Engineer shall be taken.

19.12 Sharp bending and kinking of cables shall be avoided.

19.13 Cables shall cross control room basement wall in 4" R.C.C. Hume Pipe embedded in cementconcrete in basement wall. Supply of 4" R.C.C. Hume Pipes is in the scope of contract.

19.14 In each cable run some extra length shall be kept at a suitable point to enable one or two straight through joints to be made, should the cable develop fault at a later date.

19.15 The contractor shall pull sufficient lengths of each cable to permit neat arrangement

of all cables. Cables should be extend above the glands for 10 to 15cms and identification should be tied up to the cable. Cables coming out from marshalling boxes should be supported by mesh tray and tied up with nylon ropes.

19.16 Cable splices shall not be permitted except where called for or where permitted by the purchaser.

19.17 At cable terminal points where the conductor and cable insulation will be terminated, termination shall be made in a neat, workman like and approved manner by men specialisedin this class of work.

19.18 Before any cable terminal connections are made, conductor's insulation shall be pulled out, at the end and identifying ferrules shall be fixed according to the wiring diagrams. Connection shall be made according to the wiring diagram to be supplied by the purchaser.

19.19 Polarity, or phasing shall be checked before connections are made and corrections of polarity, phasing or rotation shall be made by the contractor without additional cost.

19.20 Control cable terminations shall be made in accordance with wiring diagram using colour codes established by the purchaser for the various control circuits, by code marked wiring diagrams furnished to the contractor for this purpose or any other approved means of identification. It is the intent that the contractor shall terminate the cable which he installs with ferrules.

19.21 Additional work of testing and reconnecting where leads have been brought by the contractor to the terminal boards and connected, but where on further testing, reversed or other rearrangement of load turns out to be necessary shall be performed by the contractor without additional cost.

19.22 Any cable cut short shall be replaced and installed by the contractor at his expense.

19.23 Jointing of cables shall be in accordance with Indian Standard codes. The manufacturers special instructions on materials and tools required for cable jointing work shall be arrangedby the contractor.

19.24 Metal sheath and armour of the cable shall be binded to the earthing system of the station by a steel strip wire. Bending the metal sheaths of single core cables in close **threefold** formation shall be as stipulated in the relevant codes of practices.

19.25 The contractor shall furnish two sets of marked up cable layout drawings after installation, indicating altered cable routes and location of straight joints.

19.26 To give an idea of the work involved one set of cable schedules is enclosed

20.0 LIGHTING SYSTEM:

21.0 ERECTION OF EQUIPMENT:

The contractor has to make his own arrangements for transport of the materials/equipment asgiven in the bill of quantities and its Annexure to switchyard/ substation site. He is fully responsible to take delivery of materials/equipment and transport to the works stores at site and erect the same as per the directions of the Engineer. However, the contractor shall provide insurance to cover risks during transit from employers stores, storage and erection atsite for all fragile equipment like CBs, CTs, LAs ,insulators and Capacitor Banks etc. In case of materials/ equipment not covered by insurance, the contractor shall be very careful in handling them. However, the contractor shall take utmost care in handling the equipment during transport, storage and erection. If a crane is used in the erection of heavy equipment expenditure incurred towards the same shall be borne by the contractor himself.

On completion of the works, all materials left surplus from those supplied by the employer for erection shall be handed over to the Engineer at Switchyard site. Empty drums of conductor, cable and earth wire shall be returned to the Engineer. The contractor shall provide and make all necessary arrangements for the safety of his staff and labourers, at the site of works. The Employer will not in any way be responsible for any accident, minor orfatal to any person at the site of works or for any damages arising there from during erection and this shall be the contractor's responsibility. The staff insurance charges, if any,shall be borne by the contractor.

All tools and plant, consumables and any instruments required for erection of the equipmentshall be arranged by the contractor himself.

The scope of work shall include supply of equipment, handling transport to site and erection. The contractor shall move all the equipment coveredunder this section to the proper location, unload and shall accurately level, align and anchor the equipment. The contractor will be responsible for the safety of equipment from the time of his supplying and taking over the equipment for erection until the APSPCL takes over.

The scope of work shall also include:

a. Writing names and other details on equipment i.e. Marshalling boxes, Marshalling kiosks, Control and Relay panels etc., with the superior quality white /blue/ black enamel paint including cost of brushes, labour charges etc., complete as per the directions of engineerin charge.

b. Painting of RYB Colour on structures, equipment, isolators, LA’s etc with superior quality enamel paint including cost of paint, brushes, labour charges etc., complete as per the directions of engineer in charge.

The manufacturer's installation drawings / instructions and recommendations will be furnishedto the successful bidder. The instructions shall be correctly followed in handling, setting, test, commissioning and maintenance of all the equipment. In case of doubt as to the correct interpretation of the manufacturer's drawings or instructions, necessary clarifications shall be obtained from the engineer in-charge of the work. The contractor shall be responsible for the proper erection of the equipment and he will be held responsible for any damage consequent to incorrect handling.

For erection of control , relay and LTAC panels and DC distribution Board in control

room the channels are required to be embedded in floor and grouting of foundations bolts in these channels is also to be done by the successful bidder. Materials i.e. 100x50mm Galvanised M.S. Channels, cement and other materials required are to be procured by the contractor. Rubber mat of approved quantity is to be provided in the control room in front ofthe panels of 137 cm width and 15 mm thickness throughout the panel length.

22.0 SUPPLY OF CO2 FIRE EXTINGUISHERS:NA

23.0 CONSTRUCTION OF FIRE PROCTECTION WALL: As required.

24.0 SPREADING OF HBG METAL:

The work involves spreading of 20 mm HBG metal for 100 mm thick in switch yard by providing suitable PCC gauge blocks of 100mmX100mm size and 100 mm depth at 2mX2mintervals. Kerb wall of size 400x75x300 mm in RCC (1:2:4) shall be buried in the ground upto 100mm deep. The joints shall be filled with CM (1:3) and Kerb wall shall be provided in the switchyard to retain the metal all along the periphery of the metal spreading wherever it is required. The Kerb wall shall be plastered in CM (1:3) and painted with 2 coats of Janata Cem. Before spreading the HBG metal, care shall be taken to remove all the vegetation and roots of the plant. The trimming of the earth surface for perfect level ground should be carried

out and the surface should be watered and rammed for consolidation with suitable means andthe earth surface should be given chemical treatment for anti-vegetation growth.
Required metal quantity may be stacked at suitable area for easy handling for pre-measurement. Higher size metal may be separated and removed from the stacks. The crushed metal shall be free from dust. HBG metal shall be brought from the approved Quarry as directed by Engineer-in-charge and samples of the HBG metal to be used may be shown to the Engineer in-charge and prior approval of the engineer shall be taken before use. Spreading should be carried out by dumping the metal at lower heights.

25.0 FORMATION OF ROADS: NA

26.0 PROGRESS REPORTS: -

Weekly progress reports showing the actual progress made in the receipt of the materials by the contractor and in completion of various works shall be regularly submitted in duplicate by the contractor to the Engineer. The performance monitoring shall be carried out with the helpof computer aided system on MS project and Excel etc.

27.0 RESPONSIBILITY OF THE CONTRACTOR: -

The contractor shall guarantee and be entirely responsible for the execution of the contract inaccordance with the general conditions of contract, specifications, schedules and appendicies. He shall further guarantee and be responsible for proper erection with in the guaranteed completion and performance periods. The contractor should give binding certificate necessarily stating that he has considered supply of all items excluding specified items to be provided by the **APSPCL** listed in the Appendix-II for completion of Bay's works. The contractor should also specify in the binding certificate that he has furnished the additional items with unit rates & approximate

quantities required to complete the work and not covered in the schedules of bill of quantities. The lumpsum amount shall be quoted for finished item of work as per Specification of APSS. No extra payment over and above the quoted amount will be entertained. In case any work is not executed based on site condition suitable amount will be deducted and mutually agreed rates.

TECHNICAL SPECIFICATION

PART – II

Serial: NO	TITLE

1.0 Technical specification for common building materials

2.0 Technical specification for excavation

3.0 Technical specification for back filling

4.0 Technical specification for timbering

5.0 Technical specification for cement concrete

6.0 Technical specification for reinforced concrete

7.0 Technical specification for sub-station hardware, clamps & connectors.

8.0 Technical Specification for 245Kv Circuit Breaker – Attached

9.0 Technical specification for procurement of steel, fabrication and galvanization

10.0 Technical specification for 36KV Indoor Switchgear panels - Attached

11.0 Technical specification for marshalling boxes for CTs,PTs and CVTs

12.0 Technical Specification for CT's – Attached

13.0 Technical Specification for Isolators – Attached

14.0 Technical Specification for Lightening Arrestors – Attached

15.0 Technical Specification for C&R panels and LTAC panel – Attached

16.0 Technical Specification for Power/ Control Cables – Attached

17.0 Technical Specification for Conductor – Attached

18.0 Technical Specification for Porcelain Insulator- Attached

19.0 Technical Specification for HTGS Earth Wire – Attached

20.0 Technical Specification for Solid Core/ Post Type Insulator – Attached

21.0 Technical Specification for Bolts / Nuts – Attached.

22.0 Technical Specification for Anti-Weed Treatment and Anti Termiterea Treatment

23.0 Technical Specification for Permanent storm water drainage

PART-II

1.0 TECHNICAL SPECIFICATION FOR COMMON BUILDING MATERIALS

The aggregates such as sand, metal shall be obtained from the source as indicated in lead statements.

1.1 INDIAN STANDARDS:

The aggregates both fine and coarse shall comply with the requirements of I.S.456 for concrete and I.S.383 for sand for use in rendering, plastering and mortar except as hereinafter stated and shall be delivered to and maintained at the site, clean, washed and free from dirt.

1.2 SAMPLES:

Samples shall be submitted to the Engineer and all aggregates used in the work shall be at least equal to the approved sample .

1.3 FINE AGGREGATE:

The fine aggregate for concrete, shall consist of naturally occurring and graded in accordance with the requirements of IS.383 for grading Zone-2 or grading Zone-3 except that no particle shall exceed 3/16 inch. It shall be free from excessive sharpness. Fine aggregate for cement mortar and rendering plastering shall comply with IS 383.

1.4 COARSE AGGREGATE:

Coarse aggregate shall be graded to produce sound concrete and for reinforced concrete shall be such that at least 5% by weight will pass a mesh of a size 1/4 per inch less than the minimum lateral distance between the reinforcing bars or 1/4 inch less than the minimum cover, whichever is smaller.

1.5 WATER FOR CONCRETE:

Clean fresh water shall be used for mixing concrete grout and mortar and curing. The water used for mixing and curing shall be free from deleterious matter and acids and alkaline substances in a solution or suspension. Potable water shall generally be used for mixing and curing concrete.

1.6 WATER FOR DRINKING:

ALL POTABLE WATER SHALL BE FREE FROM DELETORIOUS MATTER AND SHALL BE EQUAL TO OR BETTER than the minimum standard acceptable to the local and state authorities. Filteration and chlorination by approved means shall be installed as necessary to obtain the required standard. Storage and distribution of potable water shall be such as to prevent contamination.

1.7 CEMENT

Ordinary Portland cement of Grade 43 manufactured as per IS 8112 of 1989 shall only be used.

Storage, certification, delivery and testing of the cement shall conform to IS:269, IS:8112 orthe latest issue.
IS certification mark is obligatory.

Cement procured from major cement manufacturing plants such as M/s Raasi, M/s Vishnu, M/s Andhra cement co., ACC, CCI, M/s L&T and Coramandel, Priyadarshini, Madras Cements etc will only be accepted for which prior approval shall be obtained from the employer. Copies of invoices and test certificates from the cement manufacturers shall be submitted by the contractor to the Engineer and his clearance obtained before actual use. Such clearance will be provided within a maximum period of one week.

1.8 REINFORCEMENT

Steel required for reinforcement will be procured by the contractor The contractor shall workout the requirement immediately after taking over the site and receipt of working drawings and take the approval of the site Engineer and arrange for procurement

2.0 TECHNICAL SPECIFICATION FOR EXCAVATION:

This clause covers excavation to be done for all the civil works. Excavation rates for all soils for foundations of (i) structures (ii) walls for control room shall be quoted. This rate should be inclusive of dewatering, shoring & shuttering required if any. Sides and bottoms of excavation shall be vertically true. Blasting material for excavation in Hard rock required if any has to be procured by bidder himself. Necessary assistance in the form of approval for procurement of the material will be given by the Board to the extent possible. All rules under explosive act shall be followed by the successful Bidder. Blasting work shall be done only after approval by the site engineer during specified hours. The person in charge of blasting shall satisfy himself that all blasts have exploded before working people are permitted to re-approach work site. Withdrawal of unexploded charge will not be permitted under any circumstances. Unexploded charge shall be flooded with water and the hole marked in a distinguished manner. Another hole shall be drilled at a distance of about 450 mm of old hole in the direction of unexploded charge and fired in usual way. This process shall be continued till the original blast is exploded. Excavation in decomposed or soft rock shall be carried out by crow bars or pic-axes or pneumatic drills etc. If he desires to do blasting, he shall obtain permission of site Engineer and do accordingly. The contractor shall adopt controlled blasting to avoid damaging of existing structures.

The rock obtained during excavation is the Board's property and it shall not be used under any circumstances by the contractor. Rock excavated shall be stacked by the successful tenderer at a convenient place within the Substation switchyard as directed by the Engineer-in-charge at no extra cost.

3.0 TECHNICAL SPECIFICATION FOR BACK FILLING:

After completion of foundation, footings and walls and other construction below the elevation of the final grades and prior to back filling, all forms of temporary shoring, timber, etc., shall be removed and the excavation cleaned of all trash, debris and perishable materials. Back filling shall begin only with the approval of the Engineer- in charge. Back filling shall be done with inorganic materials obtained from the excavation of borrow pits, if suitable, and subject to the approval of the Board's Engineer-in-charge. Back fill shall not be dropped directly upon or against any structure or facility where there is danger of displacement or damage. Backfill shall be placed in horizontal layers not to exceed 60 cm. in thickness. Each layer shall be compacted with proper moisture content and with such equipment as may be required to obtain a density equal to or greater than 95% of maximum as determined by the relevant Indian

Standards. Trucks or heavy equipment for depositing or compacting back-fill shall not be used within 1.5m of the foundation/structures, or other facilities which may damage by their weight or operation. The methods of compaction shall be subject to approval of the Engineer-in- charge. Backfill adjacent to pipes shall be hand placed free of stones, concrete, etc., compacted uniformly on both sides of the pipe and where practicable, to a depth of 300 mm over the top of pipes, when tampering around piping care should be taken to avoid unequal pressures.

4.0 TECHNICAL SPECIFICATION FOR TIMBERING

4.1 APPROVAL OF TIMBERING:

The contractor shall submit for the approval of the Engineer, dimensioned drawings showing the methods he proposes to adopt for timbering, the drawings of any temporary staging required for carrying out the works. The Engineer's approval of such drawings shall in no way relieve the contractor of his entire and sole responsibility for safeguarding adjacent works from damage.

4.2 MATERIAL & QUALITY:

All the materials used in the works shall be of the best quality of their respective kinds and specified herein. They shall be obtained from sources and suppliers approved by the Engineer or his representatives, and shall comply strictly with the tests, specified hereinafter or, where tests are not specified in this specification they should conform to the requirements of the latest issue of the relevant Indian Standards hereinafter abbreviated to as (I.S) or other approved National Standards authorised by the Engineer.

4.3 INSPECTION AND TESTING:

All the materials used in the works shall be subject to inspection and tests if required by the Engineer. Unless otherwise stated, the cost of all tests required by this specification shall be deemed to be included in the rates and prices named by the contractor in the bill of quantities. Any material which is prepared or manufactured without notice having been given in writing to the Engineer may be rejected if the Engineer considered that his inspection was necessary during the progress of manufacture of such material.

4.4 APPROVAL:

NO MATERIAL SHALL BE USED IN THE WORKS UNLESS THEY HAVE FIRST BEEN APPROVED BY THE ENGINEER OR HIS REPRESENTATIVE.

5.0 TECHNICAL SPECIFICATION FOR CEMENT CONCRETE:

5.1 CODE OF PRACTICE:

Except where otherwise specified, described or directed all concrete and reinforced concrete work shall be carried out in accordance with Indian Standard 456 Code of practicefor plain and reinforced concrete.

5.2 GAUGING CONCRETE:

Aggregate shall be measured in proper gauge boxes. When measuring the fine aggregate due allowance shall be made for the moisture content and the bulk adjusted to suit the mix.The methods adopted for gauging the concrete materials shall have the approval of the Engineer-in-charge.

5.3 CONCRETE PROPORTIONS:

The concrete shall be of nominal mix as specified in the drawings or in the bill of quantities.

5.4 CONSISTENCY:

The quantity of water used shall be sufficient to produce a dense concrete of adequate workability for its purpose, which will surround and properly grip all the reinforcement.

5.5 CRUSHING STRENGTH:

The crushing strength of the concrete should be as specified in IS.456 for the proposed mixes.

5.6 GAUGING WATER:

The General arrangements for the supply of water for mixing concrete shall be to the satisfaction of the Engineer who will determine the quantity of water to be employed in the mix according to the degree of moisture in the aggregate. The quantity of water thus determined shall be accurately measured for each separate mixing in a suitable container.

5.7 MIXING CONCRETE:

Concrete shall be thoroughly mixed to a uniform consistency in the mixing machines of approved types. Mixing shall continue until the cement is thoroughly distributed through out the mass, and shall last at least two minutes or for 80 turns of the mixer after the whole of the water has been added. Any concrete showing signs of initial setting before being deposited shall not be used in the works and shall be removed from the site. The concrete shall be discharged from the mixer on to a level watertight platform or floor or into a water tight receptacle. Normally hand mixing of concrete will not be allowed but where the total quantity of concrete is considerably small, the mixing may be done by hand subject to the approval and entirely at the discretion and satisfaction of the Engineer-in-charge.

5.8 QUALIFIED ENGINEER:

The contractor shall employ qualified Engineer with a qualification of not less than a degree in Engineering who shall be responsible for all concreting carried out for the works. He shall be available at site at all times when concreting is being carried out.

5.9 CONCRETE IN UNSUITABLE WEATHER:

In the event of rain, storms or other severe weather conditions arising, concreting shall be stopped and appropriate temporary stop ends vee groves etc., placed as may be necessary. To meet such circumstances, the contractor shall always have in readiness on the site approved framed sheeting tarpaulins etc., for the protection of newly placed concrete. Should any concrete be damaged due to rain, streams or other weather conditions, the Engineer may order the cutting out /replacement of the damaged concrete at the expenses of the contractor.

5.10 FORM WORK:

This clause is applicable for form work/ centering etc for all the civil works under the specification.

5.10.1 The form work shall conform to clause 10 of I.S.456 latest. The contractor entirely responsible for the sufficiency and efficiency of the form work, which term includes moulds, and also for the safe removal of the same. Before commencing the work he shall submit forthe approval of the Engineer, details of the form work he proposes to use but such approval shall in no way relieve him of any of his responsibilities for the sufficiency and efficiency of the work and that it will be resistant to the strains imposed on it in vibrating the concrete and will retain all the fines in the concrete as may be necessary to provide the desired concrete surface.

5.10.2 The form work shall be designed and arranged so that it will not settle under the load and can be stripped and removed without causing any blemish or jar to the concrete.

5.10.3 For beam soffits the contractor shall provide cambers or such other form which will ensure that undersides of beams are truly horizontal or cambered to the extent shown in the drawings.

5.10.4 All forms shall be securely braced and supported to prevent any sagging or bulging duringconstruction. In no circumstances shall wire ties be used. All chamber and radius strips. Liners and cores shall be provided where necessary and shall be due to space and securely fixed. All forms shall be fixed to the proper line and trued up immediately before depositing the concrete. All joints shall be close enough to prevent leakage liquid from the concrete.

5.10.5 Form work for all exposed faces of mass concrete and for all faces of reinforced concrete shall consist of approved material so finished as to produce the concrete surface, finish specified without any loss of fines and without honey-combing or bulges etc., strutting shall be of such design to allow accurate adjustment and easy removal.

5.10.6 Strutting of form work against the sides of the structures which is subject to movementor vibration will not be permitted.

5.10.7 The inside faces of the forms shall be treated with mould oil or other approved

preparation in either case, that will not have deteriorating effect either the strength or prevent the oil or other approved preparation coming into contact with the reinforcement.

5.11 REMOVAL OF FORM WORK:

The length of time between concreting and the removal of the formwork is the sole responsibility of the contractor. It shall, however, be competent, to the Engineer to require a minimum length of time. For structure foundation minimum time limit specified is 24 hours for removing form work from date of placing concrete.

5.12 STOP ENDS :

The position of temporary stop ends for vertical joints shall be as approved by the Engineer. Shuttering to form the stops shall be firmly fixed and secured round the reinforcing bars. Such concrete as passes through the stops shall be hacked off and removed as soon as the concrete has set.

5.13 CONSTRUCTION JOINTS:

Recesses of approved size and type shall be formed in construction joints where required by the Engineer in order to form a key with the following concrete. The cost of all shuttering to construction joints shall be deemed to be included in the rates named in the priced bill of quantities. Before Depositing any concrete resting or abutting on work previously carried out the surfaces and ends of the existing work shall be thoroughly racked to such an extent that no portion of the previous surface remains. Thus roughened surfaces shall be thoroughly cleaned off, brushed and watered immediately before the succeeding operations are commenced. The roughened surfaces shall be coated with cement/sand mortar 1/2 inch thick immediately before the concrete of the next layer is placed (special care shall be taken to put the mortor and fresh concrete thoroughly up against the hardened concrete).

5.14 CLEANLINESS OF FORM WORK:

Before concreting is commenced all formwork shall be scrupulously cleaned and wetted, and the contractor shall adopt all necessary measures to ensure that all debris, dirt, wash water and other refuse is removed. The reinforcement and form work will then be inspected by the Engineer and concreting shall not be commenced until the Engineer gives permission. Such inspection shall not however relieve the contractor any of his responsibility for the correctness of the work in every respect.

5.15 EXECUTION OF CONCRETE WORK:

Section limits: Concreting shall be carried out in Sections, not exceeding the limits specified for particular work.

5.16 CASTING PROGRAMME:

The contractor's casting programme shall be such that such section of work can be satisfactorily completed in one operation after permission has been given to proceed. No

claim for overtime working to complete a casting programme will be entertained.

5.17 CONVEYANCE OF CONCRETE:

The concrete shall be conveyed from the mixer to its place in the works as rapidly as possible and in such a manner that there shall be no separation or loss of the ingredients. In no circumstances shall more than half an hour lapse between the time when water is added to the mix and the time when the concrete is finally consolidated in position. The use of concrete distributing chutes at an angle of more than 45degrees from the horizontal will not be permitted without the prior written sanction of the Engineer. In no case shall concrete be dropped from barrows or otherwise from a height of more than one and half meters. The arrangements to be adopted by the contractor for conveying and depositing concrete shall be subject to the approval of the Engineer.

5.18 DEPOSITING CONCRETE:

Before any concrete is put in, the contractor shall carryout any filling of pockets or trimming the sides where found necessary to suit the level and line of the concrete to be laid as directed by the Engineer at site. Unless otherwise approved, concrete shall be placed in one operation to the full thickness of members.

5.19 CONSOLIDATING CONCRETE:

Concrete normally shall be consolidated by means of sufficient number of mechanical vibrators. Hand ramming and tamping will only be allowed where specified or by the prior permission of the Executive Engineer. Hand ramming and tamping where permitted shall be sufficient and efficient such as to produce uniform consolidation.

5.20 The concrete shall be thoroughly worked around reinforcement and against shutters so that all entrained air is duly expelled and the concrete surface when stripped be found to be good and free of the formation of air pockets, honey combing or other defects.

5.21 The concrete shall be worked into position where placed and not allowed to flow, for sloping beams the work of depositing concrete shall start from the lower end and work upwards.

5.22 Except where arrangements, approved by the Engineer are made for placing concrete under water, the areas on which concrete is to be deposited shall be made and kept free from standing water during concreting operations and running water crossing or entering such areas shall be brought under control before concreting is commenced.

5.23 FINISH OF CONCRETE SURFACES:

Immediately any wrought or metal faced for work is struck the surface of the concrete will be inspected by the Engineer and after any remedial work directed or permitted by the Engineer has been completed to his satisfaction, the contractor shall remove all form marks and other imperfections in order to give uniform appearance. The cost of this work shall be included in the rates for concrete.

5.24 Floor surfaces shall be worked to a smooth even finish to correct levels of falls as indicatedin the drawings or as directed.

5.25 Where so directed, concrete floor surfaces shall be treated with silicate of soda gradeP.84 diluted with four times its volume of water applied to the work with a watering can or spray and afterwards spread evenly with a mop or brush. Twenty four hours later a second application shall be made and, if any surface still appears porous, further applications of the solution shall be given until the work will absorb no more. Any excess of liquid on the surface after the last coat has been absorbed shall be removed and the surface allowed drying. When dry it shall be washed with the plain water.

5.26 CURING:

The curing period shall commence immediately after the concrete is finally trowelled or secreeded and continue for a period of 21 days. The top and side surfaces of concrete shall be kept moist and be protected from the direct rays of the sun during the period. The contractor shall submit to the Engineer, his proposals for ensuring continuous protection of the concrete during the curing period.

5.27 DEFECTIVE WORK:

CONCRETE WHICH IS DEFECTIVE FROM ANY CAUSE WHAT SO EVER SHALL, IF SO DIRECTED By THE ENGINEER, be cut out and the work reconstructed at the successful bidder's cost. No concrete thus cut out shall be reused.

5.28 The faces of the concrete work shall be sound and solid, free from honey combing. No 'Patching' of any concrete facing will be allowed without the express written permission of the Engineer.

6.0 TECHNICAL SPECIFICATION FOR REINFORCED CONCRETE:

The preceding clauses relating to concrete generally shall be read in conjunction with thesefollowing:

6.1 MIXES:

The mixes of concrete shall be as specified in the bill of quantities or shown in the drawings.

6.2 COVER TO REINFORCEMENT:

The reinforcement shall in all cases be covered with no greater and no less than the minimum thickness of concrete specified shown in the drawings. Where two bars cross, the outer should have the minimum cover and no more.

6.3 FORM BOLTS:

Any form bolts that are in the concrete shall be withdrawn when the forms are stripped. They shall not be placed within 2 inches of any steel reinforcement, so that the holes they leave do not reduce the effective cover on the steel.

6.4 BENDING REINFORCEMENT:

Bends, cranks or other labours on reinforcing bars shall be carefully formed exact in accordance with the drawings, otherwise, all bars shall be truly straight . Bends shall be made cold round a former having a diameter of at least four times, the diameter of the

bars.Heating of bars for any purpose what so ever will not be allowed.

6.5 SPLICING REINFORCEMENT:

Where splices or overlapping in reinforcement are required the bars shall be provided with such splices or overlaps shown in the drawings. No bars may be jointed by welding unless special permission in writing has previously been given by the Engineer, in applying for such permission the contractor shall supply full details of the method he proposes to use.

6.6 FIXING REINFORCEMENT:

The number, size, form and position of all steel reinforcing bars, ties, links, stirrups and other parts of the reinforcement shall be exact in accordance with the drawings, and such parts shall be kept in the correct positions in the forms without displacement during the process of working the concrete into place. Space bars, supporting stools and distance pieces to maintain the reinforcement in the correct position shall be provided by the contractors as directed by the Engineer, without any extra cost to the Board.

6.7 The use of timber blocks for welding the steel of the forms will not be permitted.

6.8 All straight bars shall be fixed parallel to each other and to the sides of the forms. Any ties, links or stirrups connecting the bars shall be tied so that the bars are properly braced, the inside of their curved parts shall be in actual contact with the bars round which they are intended to fit.

6.9 BINDING WIRE:

Bars shall be bound together with black annealed steel wire No.16 S.W.G thick and the binding shall be done tight with proper pliers or automatic binders. The free ends of the binding wire shall be sent in walls. The rate of reinforcement should be inclusive of cost of binding wire.

6.10 STEEL TO BE CLEAN:

All steel reinforcement before the concrete is deposited shall be clean and free from all loose mill scale, dust and loose rust, and coatings such as paints, cement, grout etc.,

6.11 DEPOSITING:

No concrete shall be deposited until form work and reinforcement has been inspected and approved by the Engineer. Care shall be taken that the steel reinforcement is thoroughly surrounded by the concrete and that no voids or cavities are left. Consolidation of the concrete, either by hand or mechanical vibration, shall be to the satisfaction of the Engineer, and under no circumstance shall consolidation obtained by heavy impact on theform work.

6.12 The top of each layer of concrete shall be laid parallel to the longitudinal axis of the work and shall not be at a slope to it.

6.13 DEFECTIVE WORK:

If, on the removal of the shuttering any honey combing or other defective

workmanship shall be found in the face of the concrete, the Engineer will decide whether, in his opinion, the strength of the member is affected, and whether 'Patching' will be permitted in which case the defective concrete shall be cut out to the extent ordered by the Engineer, and the remaining concrete thoroughly cleaned and made good. If before or during this operation, any reinforcing bar is exposed, the cutting out shall continue right round the bar, to form a key. Where reinforcing bars are so exposed, care shall be taken to ensure that they are not damaged by the tools used for cutting out the concrete.

6.14 If, in the opinion of the Engineer, the strength of the member is affected by the defective materials or workmanship, he may direct that the whole members shall be removed and a new member constructed by the contractor without charge. The contractor may however, elect to carry out load test at his own cost, and if the load test shows results sufficiently satisfactory to the Engineer, the member may be left in place, provided all surface defects are made good by the contractor without charge. The weight of the test load will be determined by the Engineer.

6.15 If 'Patching' is discovered which has been carried out without the permission of the Engineer, the whole member affected will be liable for rejection, in which case the member shall be removed and a new member constructed by the contractor, all without charge.

6.16 SCAFFOLDING:

The rates quoted by the tenderers for all civil works shall be inclusive of scaffolding charges required if any. Materials and labour required for scaffolding shall be arranged by the contractor himself.

7.0 TECHNICAL SPECIFICATION FOR SUBSTATION HARDWARE, CLAMPS & CONNECTORS

7.1 DESIGN FEATURES AND GENERAL SPECIFICATIONS:

7.1.1 The connectors used for connecting Aluminum bus bars, tubes and ACSR conductors should be made of Aluminum Alloy in conformity with IS: 617/1959 and latest ISS and shall have adequate strength for use in the outdoor conditions. The clamps and connectors shall be in accordance with the requirements in BS: 159/1957 and IS: 5561/1970 or latest ISS.

7.1.2 The clamps and connectors shall be of adequate cross sectional area to be able to carry the full load current as well as the heavy rush of current during short circuits. The connectors shall be rated for 1200 Amps & 2500 Amps rating as per the requirement. The temperature rise shall not exceed that specified in Clause-6 of IS: 5561/1970 when carrying rated normal current of the conductors/tubes connected to the clamps. The clamp shall comprise not more than 2 pieces other than Bolts and Nuts wherever the connection takes place with conductor of ACSR.

7.1.3 The clamps shall be so designed as to be able to withstand the force arising under service conditions due to expansion and contraction.

7.1.4 The clamps shall have current paths as short and direct as possible.

7.1.5 Clevices in which moisture is likely to get accumulated shall be avoided.

7.1.6 The design will be such as to allow the pressure of clamping Bolts and evenly distributed over clamping surface, in order to avoid strain in the conductor and also to avoid hotspots. The contact pressure for which the joint is designed shall be indicated.

7.1.7 Where connections between copper and aluminum are involved suitable bimetallic strips shall be used so that electrolytic action between the two metals prevented. Copper coating on Aluminium will not be accepted.

7.1.8 Bolts, Nuts and Washers used with the connectors shall be made of mild steel and shall be hot dip galvanised and made corrosion resistant as recommended in BS: 1706/1960. Clamps and connectors should be provided with double Bolts, Nuts and Spring Washers.

7.1.9 The busbar clamps and equipment connectors should be so shaped as to facilitate formation of smooth curves for the jumper connections. Where the terminals pad or stud isin vertical plane and the jumper is to be taken horizontally or vice-versa, necessary 'L' clamps should be supplied along with the terminal connectors. The drawings for each type of clamps set should accompany the Tender.

7.1.10 To facilitate easy identification at the time of use of the clamps and connectors, the diameter of the conductors being connected and the terminals of the equipment maybe provided on all the clamps and connectors.

7.1.11 The finishing of the clamps shall be neat in appearance and should exhibit high workmanship.

7.2 DESIGN FEATURES AND GENERAL SPECIFICATION FOR HARDWARE FITTINGS

7.2.1 TENSION HARDWARE FITTINGS:

The hardware fittings shall be made of heat treated malleable cast iron or drop forged steel and shall be hot dip galvanised. The clamps and fittings shall be tested in conformity with ISS: 2486,Part-I and II/1963 with latest amendments, if any. The hardware shall be suitable for use with ball and socket type insulators of 16 mm pin diameter.

(a) The tension set hardware include complete set of tension materials without disc insulators) with bolted type tension clamps and metal parts such as 'U' bolts, ball link, socket eye etc., complete in all respects and include all fittings necessary for bus bar stringing.

(b) The 'Tension Clamp' body shall be made of Grade-A malleable cast iron to IS:2108/1962 or Grade-B malleable iron to BS:310/1958. They should ensure long and continued service withstanding the vibration fatigue and free from blow holes and other casting defects such as cracks etc.,

(c) The tension clamps shall be of bolted type and shall not permit slipping of or

damage toor failure of the complete conductor at any part thereof at load less than 95% of the ultimate strength of the conductor specified in the Appendix.

(d) The slipping strength and ultimate strength shall not be less than the specified values given below

Sl.No.	Particulars	Suspension Sets(Kgs)	Tension Sets(Kgs)
I	Hardware Clamps for ACSR Conductors :		
a.	Sliping Strength	3,300	6,650
b.	Ultimate Strength	7,000	7,000
c.	Minimum failing load	7,000	7,000
II.	Other Hardware Minimum failing loads	7,000	7,000
III.	Tension Clamp for 7/8" SWG Galvanised steel wire minimum breaking minimum breaking load of standard wire.	6,400	
IV of	Fault Current Ratings (On 220 KV 40 KA for duration 3.0 Seconds and on 132 KV, 31.5 KA for a duration of 3 secondsand on 33 KV 25 KA for a duration of 3.0 Seconds).		

(e) Bolts, Nuts and Washers used shall be made from mild steel and shall be hot dip galvanised and made corrosion resistant as recommended in BS: 1706/1960. The insulator stringing hardware including clamp body be hot dip galvanised. Electro galvanisation is not acceptable.

(f) The design will be such as to allow the pressure of clamping bolts evenly distributed overclamping surface in order to avoid strain in the conductor and also to avoid hot spots.

(g) The 'U' Bolts shall be fitted with hexagonal nut and a checknut and washers. After tightening, two or three threads must be left over.

(h) The clamps shall be suitable to Panther/ Zebra/Moose ACSR Conductor

(i) All forging and casting shall be of good finish free from flaws and other defects. The edges of the outside fittings such as at the eye, clevis and holes shall be rounded. For use with ACSR conductors, Aluminium liners are to be provided for clamps and Aluminium saddle shall be provided at each 'U' Bolts point for tightening the 'U' bolts.

(j) The edge of the clamps body shall be atleast one and half times the diameter of the bolts to ensure prevention from breakage while tightening.

(k) The clamps shall be so designed, so as to withstand the force arising under service conditions due to expansion and contraction.

(l) The design of the suspension clamps shall be such as to avoid all hard spots and links which are likely to injure the conductors. There shall be no sharp radii of curvature and ridges. Suspension clamps shall be so designed that the effects of vibration, both on the conductor and fittings itself are minimised. The clamps shall have ease of oscillation around a horizontal axis, light in weight, low effective power loss and small moment of inertia. The suspension clamp shall permit the conductor to slip before failure of the conductor occurs and shall have a sufficient slipping strength to resist conductor tension under broken wire conditions. It shall have sufficient contact surface tominimise damages due to fault currents mentioned in the Appendix. The suspension clamps shall be provided with suitable socket or clevis eye for connecting it to the insulator string.

(m) The body of the suspension clamp shall be made out of the high strength Aluminium Alloy and the hardware fittings with malleable cast iron.

(n) Tension clamps of compression type which require hydraulic compressors will not be accepted.

(o) The 'U' bolt type tension clamps shall be designed in such a way to bond the conductor through an arc of 60 to 120 deg. and to grip the conductors with pressure applied by 'U' Bolts.

7.2.2 BOLTED TYPE TENSION CLAMPS FOR GROUND WIRE:

The tension clamp shall be made of hot dip galvanised malleable iron and shall be suitable for stringing 7/8" SWG ground wire for a working tension of 450 Kgs. The clampshall be completed with eye link anchor shackles, bolts, nuts ,washers and tinned flexible copper earth bonds. The clamp shall have provision for fixing the copper earth bonds. The slipping strength of the clamp should not be less than 95% of the breaking load of 6400kgs and the breaking strength shall not be less than the ultimate breaking strength (minimum breaking load) of the ground wire.

(a) The tension clamp shall be designed to withstand the following bus tensions:

(i) For 220/132 KV Bus : 900 Kgs. for each conductor.

(ii) For 33 KV Bus : 450 Kgs. for each conductor.

(b) All tests as per ISS shall be conducted as per latest ISS

7.3 The successful contractor should submit manufacturer drawings for each item in triplicate well in advance of commencement of the bus stringing and jumpering works and got approved by Employer. All tests in accordance with latest issue of ISS/BSS shall be performed on all the hardware, clamps & connectors before supply by manufacturer.

8.0 Technical Specification for 245Kv Circuit Breaker- Attached (Section-8)

9.0 TECHNICAL SPECIFICATION FOR PROCUREMENT OF STEEL, FABRICATION &GALVANISATION

9.1 STEEL:

Procurement of steel, such as MS angles, plates, channels, RS Joists, MS rounds foundation bolts and earthing electrodes etc, required for fabrication of structures and reinforcement steel for structural foundations are within the scope of contract. The following provisions shall apply in connection with the procurement of steel by the tenderer.

a) Steel used for fabrication of structures shall be of mild steel of tested quality as per IS-2062. The steel rods used for foundation bolts and U-bolts shall be of mild steel of tested quality as per IS-432. Torr steel required for structural foundation shall be of tested quality as per IS-1786.

b) The tenderer shall take into account the fabrication wastage while quoting the rate. The Board will not accept any liability in connection with the wastage of steel during fabrication or otherwise.

c) The substitutions if any of steel sections of the structure parts by higher sizes due to non-availability of or otherwise shall be to the suppliers account. The Board will not accept any liability on this account. This is also applicable in case of steel sections for reinforcement steel for structural foundations.

d) The steel shall be procured exclusively from the main steel producers approved by the employer. However, sections not rolled by main producers can be procured from re-rollers approved by the employer provided that Re-rolling of structural steel sections is done from billets/ingots of tested quality& Re-rolled sections are duly tested as per relevant standards.

e) Bolts, Nuts and Spring washers are under the scope of contract and these shall be procured from approved suppliers of the Employer. The bolts and nuts shall conform to the following Standards.

i) The bolts shall conform to IS-12427/1988 and its latest revision if any.
ii) The bolts shall be of product grade C as specified in IS:1367(Part-2) 1979.
iii) The nuts to be used for the above bolts shall conform to the requirements ofIS-1363 (Part-3) 1984. The nuts shall be of a property class 5 as specified in IS-1367 (Part-6) 1980. The proof stress value shall be as follows:

Nominal nut size	Proof stress (Sp)
	N/Sq.mm
M 16	490
M 20	500

The bolts shall be of property class 5.6 as specified in IS-1367 (Part-3) 1979.

The bolts and nuts shall be hot dip galvanised in accordance with the requirement of IS-1367 (Part-3)1983.

f) The spring washers shall be of type B and shall conform to IS-3063-1972, including latest revision if any. The spring washers shall be made from high quality spring steel conforming to IS-4072-1975, including its latest revision if any. The spring washers shall be electro-galvanised conforming to Grade 4 of IS-1573-1986 with a coating thickness of 25 microns.

g) The contractor shall submit copies of invoices/test certificates for the purchase of steel, bolts & nuts, washers etc. to the engineer and obtain his clearance before actual use. Such clearance will be issued within a maximum period of one week.

9.2 FABRICATION & WORKMANSHIP:

In the fabrication of structures, the process of straightening maintaining clearances, cutting holding, assembly, riveting , bolting, welding are to be in accordance with clause 32 to 39 of IS 800. All the structures shall be fabricated in accordance with the drawings supplied by the Board. All the structural members shall be fabricated to bolt together easilyon the site without any unique strain on the members or bolts. All steels sections, before any cutting work is started shall be carefully straightened and toned by pressure and not by hammering. Strict quality control shall be maintained at all stages of fabrication to ensure proper performance of structures.

9.3 GALVANISING:

All members of structures and special structures "U" bolts etc., shall be hot dip galvanised. Stubs and foundation bolts shall also be hot dip galvanised upto one third length of stub and foundation bolts from top.

Galvanisation shall be done by hot dip process in full compliance with IS:2629 - 1966 and IS:4759 - 1968 where any materials is to be galvanised it should be free from greases and paint, etc., during and after galvanisation. After galvanising the surface shall be free from all sharp edges and metal nodules and there shall be no clogging of bolt holes due to the stay of zinc in the holes after galvanising.

Tests on the galvanised samples shall be carried out regularly strictly in accordance with IS:2633 -1972. The entire batch represented by the defective sample piece shall be rejected and re-galvanised to satisfy the test requirements. In addition strict inspection of the galvanised materials shall be carried out by the contractor before dispatch and any visible or suspected defects shall be rectified forthwith.

The bidders shall submit with their bids full specification of the quality of zinc to be used stating its percentage purity and the process of galvanisation adopted by them along with the devices and facilities available with them for more authoritative and better control of quality of galvanising. They shall also state the maximum percentage increase in the weight of the completely galvanised materials compared to their black weight and steel with weight of the galvanised structures.

9.4 MARKING:

Each part of steel structure shall be clearly stamped with 20mm steel stamping die with identification number mark or symbol to facilitate erection corresponding to those shown in erection drawings. These marks shall be applied before painting/galvanising and shall be clearly visible after painting.

9.5 BOLTS, NUTS & WASHERS:

Galvanised bolts and nuts and plain spring washers required for the assembly of the fabricated pieces to form into a composite structure of standard quality shall be supplied by the Contractor. The U-Bolts for stringing and foundation bolts for main and auxiliary structures are however to be fabricated and supplied by the tenderer. The required MS rounds for U-bolts and foundation bolts shall be procured by the tenderer. The fabrication of U-bolts and foundation bolts will be under the fabrication item. The nutsrequired for these bolts shall be procured by the tenderer.PACKING:

The materials shall be packed in bundles securely wrapped four times around at each end with No.9 SWG wire with ends twisted as per the practice of latest ISS.

9.6 INSPECTION & TESTING:

A representative of the purchaser shall have access to the contractor's works at any time during working hours for the purpose of inspecting the manufacture, storage and assembly of steel structures. He may select test samples going into the manufacture and the contractor shall furnish facilities for testing such samples. The check assembly shall be done with the structure in a horizontal position and not erected vertically. For the check assembly, bolts and nuts shall be no more than finger tight.

9.7 WEIGHTS OF STRUCTURES :

The weight of structures as per bills of materials will be considered for the payment of supply, fabrication, galvanisation and erection bills. If the designed steel section is not available, higher section shall be used only after obtaining prior approval from APSPCL. Incase of such approvals the cost of supply, fabrication, galvanisation and erection for extra weight shall be borne by the Bidder.

9.8 RESPONSIBILITY OF THE TENDERER:

The tenderer is responsible for proper workmanship and accuracy of fabrication of the materials. The defective materials are to be rectified or made good at his cost. He is also responsible for safe delivery of the goods in good condition at the destination i.e. substation site.

10.0 Technical Specification for 33KV Indoor Switchgear- Attached (Section-10)

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11.0 TECHNICAL SPECIFICATION FOR MARSHALLING BOXES FOR C.Ts, P.Ts,

The box should be made of 2 mm thick Galvanised M.S. Sheet of size 750x400x150

mm with hinged type door, vermin proof and weather proof. Rubber beading has to beprovided around the door. Necessary brackets on the back side of the box should be provided for mounting on the structures. Doors of the box should be provided with panel type look. The top portion of the box shall be slanting so that rain water will fall away easily.Two rows having 20 Nos. terminals in one and 14 Nos. in other should be provided in the box. The terminals should be of disconnecting and testing type (Type CDTTS of 'connected make'. Three Nos. holes (Half punched) suitable for 6x2.5 sq.mm Coppercable and 3 Nos. holes (half punched) suitable for 4x2.5 Sq.mm copper cable should be provided at the bottom to take the cables into the box. Suitable cable glands should be supplied. Terminals in the Marshalling box should have facility for easy earthing, shorting, isolating and testing. The following (as per drawing enclosed) are also required. 2 Sets ofEarthing stud of 1/2" dia with suitable nuts, flat and spring washers are to be provided as shown in drawing.

For Marshalling boxes for PTs : Ten Nos. (10 Nos.) HRC fuses of 2 amps rating of M/s. English Electric Co., with neutral link (with Bolts and Nuts) and one No. 3 MCB (10 amps) (M/s. MDS make).

12.0 Technical Specification for CT's- Attached (Section-12)

13.0 Technical specification for Isolators- Attached (Section-13)

14.0 Technical specification for LA's – Attached (Section-14)

15.0 Technical specification for C& R panels & LTAC Panels -Attached (Section-15)

16.0 Technical specification for Power & Control Cables – Attached (Section-16)

17.0 Technical specification for Conductor -Attached (Section-17)

18.0 Technical specification for Porcelain Insulator -Attached (Section-18)

19.0 Technical specification for HTGS Earth Wire – Attached (Section-19)

20.0 Technical specification for Solid core insulators/ Post type insulators – Attached (Section-20)

21.0 Technical specification for Bolts & Nuts – Attached (Section-21)

22.0 Technical specification for Substation works

23.0 TECHNICAL SPECIFICATION FOR ANTI -WEED TREATMENT AND ANTI – TERMITETREATMENT:

23.01 ANTI-WEED TREATMENT: For safeguarding against the growth of weeds in the switchyard area weedicides (such as Biodex-C, Grammaxene, Fernoxene or equivalent products) should be mixed with water in accordance with the manufacturer's instruction (3 liters of weedicide mixed with 200 liters of water is a standard practice) and this solution should be spread over the earth with a chemical spraying pump on the ground.

The anti-weed treatment should be given only after moisture content of the soil is brought below 29%. After completion of spraying of the anti-weed chemicals and before taking up the next activity, a period of 24 hours should be allowed for penetration of the chemical into the soil.

23.02 ANTI-TERMITE TREATMENT:

23.03 SCOPE: The scope of work is to be set up a chemical barrier against attack by subterranean termites in the areas like cable trenches etc.

23.04 GENERAL: All work shall in general, be executed as specified in IS:6313 part -II and asper approved specification of the agency having special know-how for the job. All necessary work to ensure uniform distribution and proper penetration of treating solution shall be done according to the instructions of the Engineer. Soil treatment shall not be donewhen it is raining or when the soil is wet with rain or sub soil water. Once formed, the treated soil barrier shall not be distributed.

23.05 CHEMICALS AND RATE OF APPLICATION : Any of the following chemicals (conforming to relevant Indian standards) in water emulsion shall be supplied by pressure pumps uniformly over the area treated.

Chemicals		Concentration / weight percent
Dieldrin	(IS : 1052-1962)	0.5
Aldrin	(IS : 1306-1958)	0.5
Chlordane	(IS : 2863-1964)	1.0
Heptachlor		0.5

23.06 TREATMENT OF CABLE TRENCHES: Cable trenches may be fully enveloped by the chemical barrier by treating with chemicals at the rate of 15 liters /sqm on vertical surfaces of excavated trench walls and bottom surfaces at the rate of 5 liters / sqm. Chemical treatment shall be done in stages following the compaction of earth in layers. The treatment shall be carried out after the ramming operation is done by rodding the earth at 150mm centres close to the wall surface and spraying the chemicals in the specified dose.

23.07 TREATMENT OF EXPANSION JOINTS: These shall receive special attention and shallbe treated in the manner approved by the Engineer.

23.08 ACCEPTANCE CRITERIA: The contractor shall give a oneyear service guarantee in writing supplemented by a separate and unilateral guarantee from the specialized agency for the period at no extra cost to the Employer.

23.09 I.S. CODE: Relevant code applicable for this specification: IS:6316 (part-II)- 1971: Code of practice for Anti-termite measures in building.

SECTION-III: FINANCIAL

Bid Prices: Bid Prices: The prices quoted shall be **Firm** except for **Cement, Reinforcement steel and Earth Flat (GI &MS)** in Schedule B and **Substation Structures, Cables, Isolators and Conductors** in schedule –A. The estimates / Schedules are prepared with prices FADS inclusive of packing and forwarding, ***GST based-HSN/SAC s***ignorage charges, , Labour welfare Cess and other legally permissible duties and levies wherever applicable, handling charges to cover the transport from destination to site / stores, unloading at destination and insurance (transit and storage at site including erection risks), civil ,erection ,testing and commissioning .

It is the responsibility of the Bidder to verify the correct rates of duties and taxes leviable on the materials and services at the time of bidding It is the responsibility of the Bidder to verify the correct rates of duties and taxes leviable on the materials and services at the time of bidding. The proforma credit available to the bidder on the purchases of inputs (raw materials) (IPC) consequent to the introduction of **"GST" Scheme** may be taken into account while quoting the prices. The Bidder shall indicate the total bid price of the Materials and services under the contract in Schedule-C.

I. In case of local supplies, sales tax, local taxes and other levies and duties solely in respect of the transaction between the APSPCL and the Contractor under the contract, if any shall not be included in the bid price, but those shall be indicated separately, wherever applicable. These amounts will be payable (along with subsequent variation if any), by the Employer on the supplies made by the Contractor **but limited to the tax liability on the transaction between the APSPCL and the contractor.**

1.1 For Equipment & Materials and for works:

The Bidder has to quote in Schedule-C, the percentage (both in words and figures) Excess/ On Par/ Less over the total estimated contract value given in the Schedule-A + Schedule-B. The detailed contract order will be released duly applying the quoted percentage on Schedule-A + Schedule-B.

The quoted rates i.e. quoted percentage on Schedule-A + Schedule-B shall remain same irrespective of (i) increase / decrease in quantity (ii) execution of contract beyond the scheduled completion period for whatever reasons (iii) increase in the rates of material or labour or both during execution with and beyond the completion period. However Price variation as per Clause 1.2, Statutory Variation as per Clause 2 *and applicable rates for supplemental quantities beyond agreement quantities* as per Clause 3, shall be applicable.

1.2.0 **PRICE VARIATION (PV) Clause:**

The price variation is applicable for Cement and Reinforcement steel in works schedule and Transmission Line Tower Parts, Substation Structures, Earth Flat (GI &MS), Cables, Isolators and Conductors in materials schedule and the calculation of Price Variation is as below.

1.2.1 The Price Variation is applicable in respect of the items Cement and Reinforcement steel as

per G.O.Ms.No.94, Dt.16.04.2008 and T.O.O (CE-Civil) Ms.No.24, Dt.28.04.2008.

a) The price adjustment shall be applicable within original contract period or Period extended on grounds of the departmental delays and valid reasons and shall not be applicable to the extensions granted on account of the contractor's fault as envisaged in G.O.Ms.No.94 of I&CAD.

b) The price adjustment shall be applicable for actual components of works actually carried out during the period of the bill. The price variation formula is PV = (Final Rate – Basic Rate) * Quantity.

c) The price adjustment will be applied for all variations in Base Rate by more than 5% (no ceiling in increase or decrease) (As per T.O.O.Ms.No.5(CMD) dated 10.12.2013) i.e. actual variation will be considered if increase or decrease is more than 5%.

   i. Thus if the price excess is 10%, payment will be made only to the extent of 5% (10% - 5%). Further same procedure should be is also followed for Negative price variation.
   ii. For the time extension due to department fault, both +ve and –ve price variations are applicable
   iii. For the time extension due to contractors fault, Negative price variation is applicable

d) The Basic rate of reinforcement steel and cement as taken in the estimate were furnished in Project Data Sheet.

e) The final rate of Cement for the purpose of price variation shall be the rate informed by Govt. of A.P for the month during which to the works are executed and for reinforcement steel the rate is one month prior to which the works are executed.

f) The rate communicated by GoAP for reinforcement steel and cement are exclusive of all taxes and. Price variation amount will be given with GST

1.2.2 The Price adjustment applicable in respect of the items Transmission Line Tower Parts, Substation Structures and Earth Flat is as per T.O.O (CE-Const) MS. No 50 and T.O.O. (CE-Const) Ms. No.87 dt.10-06-2008 and as per T.O.O. (CE-Construction-2) Ms. No.242 dt.08-11-2012 subject to the following conditions.

   a) The price adjustment shall be applicable within original contract period or period extended on grounds of the departmental delays and valid reasons and shall not be applicable to the extension granted on account of the contractor's fault.

   b) Price adjustment shall be applicable for actual components of items of supply actually carried out. The price variation formula is PV = (Final Rate – Basic Rate) * Quantity.

   c) The adjustment scheme will be applied where the variation is more than 5%.

i) Thus if the price excess is 10%, payment will be made only to the extent of 5% (10% - 5%).Further the same procedure should be also followed for Negate price variation.

ii) For the time extension due to department fault, both +ve and –ve price variations are applicable.

iii) For the time extension period due to contractors fault, only -ve price variation is applicable

g) The Basic rate of Transmission Line Tower Parts, Substation Structures and Earth Flat as taken in the estimate were furnished in the Project Data Sheet.

h) The final rate of Transmission Line Tower Parts, Substation Structures for the purpose of price variation shall be the rate communicated by the Chief Engineer / Construction for every month as on 2 months prior to the date of Dispatch and for earth flat one month prior to the date of Dispatch.

i) The rate communicated by APTRANSCO for Transmission Line Tower Parts, Substation Structures and Earth Flat is exclusive of all taxes and hence Price variation amount will be given with GST.

1.2.3 Price variation (PV) clause for Supply of Conductor:

Price Variation is applicable in respect of Supply of Conductor and the price shall be based on and subject to adjustment due to variations in the following factors:

i. **E.C. Grade Aluminium:** The ex-works cost of indigenous E.C. grade aluminium wire rod based on average price of M/s. Nalco, Balco, Hindalco, and Malco as given in CACMAI circulars prevailing ***as on 30 days prior to the bid submission closing date as per NIT.***

ii. **HTGS wire:** The ex-works cost of per MT of HTGS wire exclusive of duties and taxes prevailing corresponding to 3.00 to 4.09mm designation as given in CACMAI circulars prevailing ***as on 30 days prior to the bid submission closing date as per NIT***

iii. The above basic prices of raw materials will remain unaltered during the execution of contract.

iv. For any variation up or down in the prices of raw materials as defined above, for every one rupee change in the rate of one MT of EC grade aluminum wire rod and HTGS wire the corresponding increase or decrease in price per KM of finished conductor allowable shall be as given below:

CONDUCTOR	Variation in Rs. Per KM of conductor	
	For Aluminium	For HTGS wire 3.00 mm to 4.09 mm
Panther ACSR Conductor	**0.588**	**0.388**
Zebra ACSR Conductor	**1.185**	**0.438**
Moose ACSR Conductor	**1.467**	**0.537**

v. For the purpose of calculation of price variation the prices of HTGS wire and EC grade aluminum shall be taken as those prevailing on the first working day of the calendar month one month prior to the date of delivery.

vi. The Base and final prices / indices shall correspond to same manufacturers as given in the CACMAI. The price variation formula is PV = (Final Rate – Basic Rate) * Quantity.

vii. The date of delivery shall be the date of receipt of materials in good condition at destination stores (i.e. check measurement date as per Form-13) for the purpose of price variation calculations.

viii. If the delivery of the material is within the scheduled delivery period, the Price Variation applicable will be based on the actual delivery.

ix. In case the purchaser advances the delivery, the price variation applicable will be based on the actual delivery.

x. Irrespective of increase in the prices of raw materials, the total Price Increase per KM of the Conductor will be limited to a maximum of 50% over the Unit price mentioned in Purchase Order. However there is no ceiling for negative variation.

xi. The Price Variation amount can be claimed for each batch of supplies made from time to time (out of total quantity) and will be payable after due verification

xii. In case of conductors, where the supplier makes his own arrangements to get the Rod made out of Aluminium Ingots, the prices of Aluminium Rod as per CACMAI mentioned above will only be taken into consideration for arriving at the price variation claims irrespective of whatever expenditure the supplier might have incurred in getting the ingot converted into Rod.

xiii. If the date of delivery as defined in the P.V. formula is beyond the contracted delivery date the contracted delivery date or the actual delivery date whichever is advantageous to the Purchaser will form the basis for calculation of price variation.

xiv. Notwithstanding the formula applicable for regulating the price variation, if at any time any documentary evidence proof or certificate in regard to the price variation bills is required by the Purchaser, the supplier will have to furnish the same to the Purchaser.

1.2.4 Price variation clause for cables and isolators :

1.2.4.1 The Price Variation applicable in respect of cables and Isolators is subject to the following conditions:

a) Price variation shall be applicable for both upward and downward variation in prices of respective items within the original completion period. Price variations for all cables and isolators have been adjusted with IEEMA.

b) The price quoted/accepted shall based on the input cost of raw materials/components and labour cost as on the date of quotation and the same is deemed to be related to prices of raw materials and all India average consumer price

index number for industrial workers as specified in the price variation clauses given below in case of any variation in these raw materials prices /indices, the price payable shall be subject to adjustment up or down in accordance with the formulae mentioned under clause 1.2.4.2 below.

c) For the purpose of Price adjustment, the date of delivery shall be the date on which the cable is notified as being ready for inspection / dispatch. (In the absence of such notification, the date of manufacturer's dispatch note shall be considered as the date of delivery) or the contracted delivery date (including any agreed extension thereto) whichever is earlier.

d) The price variation amount can be claimed for each batch of supplies made from time to time (out of total quantity) and will be payable after due verification.

e) If the date of delivery as defined in the P.V. formula is beyond the contracted delivery date, the contracted delivery date or the actual delivery date whichever is advantageous to the APSPCL will form the basis for calculation of price variation.

f) The total adjustment for Control cables, LT Aluminium power cable and Isolators shall be subject to a maximum ceiling of (+ 50%) individually of the respective Ex-works prices/bid prices (own manufactured/bought out items as the case may be).However there is no ceiling for negative variation.

g) Notwithstanding the formula applicable for regulating the price variation, if at any time any documentary evidence proof or certificate in regard to the price variation bills is required by the APSPCL, the supplier will have to furnish the same to the APSPCL.

h) IEEMA indices have been taken into consideration for arriving the base rates of all cables and isolators.

1.2.4.2 PRICE VARIATION FORMULA APPLICABLE FOR CABLES

i) For Steel Armoured PVC Insulated Copper Control Cables:

P = P0 +CuF(Cu-Cuo)+CCFCu(CC-CCo) + FeF(Fe-Feo)

ii) For Unarmored PVC Insulated Copper Control Cables:

FeF = 0

P = P0 +CuF(Cu-Cuo)+CCFCu(CC-CCo)

Wherein,

P = Price payable as adjusted in accordance with the above formula in Rs per Km

P_0 = Price quoted/accepted in Rs per Km

CuF = Variation factor for **Copper** applicable depending upon type and size of the cable.

Cuo= Price of CC copper rods

This price is as applicable on the 1st working day of the month, one month prior to the date of tendering.

CCFCu = Variation factor for **PVC Compound** applicable depending upon type and size of the cable.

CCo = Price of PVC Compound

This price is as applicable on the 1st working day of the month, one month prior to the date of tendering.

FeF= Variation factor for **Steel** for Steel Armoured PVC Insulated Copper Control Cables applicable

depending upon type and size of the cable.

Feo = Price of steel strips/steel wires

This price is as applicable on the 1st working day of the month, one month prior to the date of tendering.

Cu = Price of CC copper rods

This price is as applicable on the 1st working day of the month, two months prior to the date of delivery.

CC = Price of PVC Compound

This price is as applicable on the 1st working day of the month, two months prior to the date of delivery.

Fe = Price of steel strips/steel wires

This price is as applicable on the 1st working day of the month, two months prior to the date of delivery.

(*) Variation factor for copper conductor (CuF), PVC compound (CCFCu) for PVC Insulated Control Cables, Steel (FeF) for control cables with copper conductor is tabulated below.

TABLE - I

VARIATION FACTOR FOR COPPER CONDUCTOR (CUF) CONTROL CABLE WITH COPPER CONDUCTOR

No. of Cores	Nominal Cross Sectional Area (in Sq mm) = 2.5 Sq mm
2	0.047
3	0.070
4	0.094
5	0.117
6	0.141
7	0.164
8	0.182
9	0.205
10	0.235
12	0.282

14	0.329
16	0.376
18	0.410
19	0.446
20	0.456
24	0.563
27	0.634
30	0.704
37	0.869
44	1.033
52	1.221
61	1.432

TABLE - II

VARIATION FACTOR FOR PVC COMPOUND (CCFCu) PVC INSULATED CONTROL CABLEs WITH COPPER CONDUCTOR

No. of Cores	Core Size) = 2.5 Sq mm	
	Unarm	**Arm**
2	0.125	0.139
3	0.141	0.157
4	0.161	0.179
5	0.187	0.206
6	0.234	0.260
7	0.234	0.260
8	0.292	0.325
9	0.300	0.335
10	0.303	0.337
12	0.334	0.371
14	0.389	0.409
16	0.435	0.458
18	0.474	0.500
19	0.476	0.501
20	0.519	0.546
24	0.584	0.615
27	0.631	0.664
30	0.706	0.743
37	0.835	0.879
44	1.019	1.026
52	1.100	1.158
61	1.246	1.312

TABLE – III

VARIATION FACTOR FOR STEEL (FeF) PVC INSULATED CONTROL CABLES WITH COPPER CONDUCTOR

No. of Cores	Core Size = 2.5 Sq mm	Shape of armour
2	0.277	W
3	0.289	W
4	0.314	W
5	0.342	W
6	0.379	W
7	0.379	W
8	0.456	W
9	0.275	F
10	0.325	F
12	0.342	F
14	0.360	F
16	0.372	F
18	0.350	F
19	0.397	F
20	0.400	F
24	0.475	F
27	0.478	F
30	0.503	F
37	0.548	F
44	0.601	F
52	0.641	F
61	0.685	F

iii) For Aluminium conductor PVC Insulated Cables:

P = P0 +AIF (AI-AIo) +CCFAI (CC-CCo) + FeF (Fe – Feo)

Wherein,

P = Price payable as adjusted in accordance with the above formula in Rs per Km

P_0 = Price quoted/accepted in Rs per Km

AIF= Variation factor for **Aluminium** applicable depending upon type and size of the cable.

AIo= Price of EC grade aluminium rods (proper Zi rods)

This price is as applicable on the 1st working day of the month, one month prior to the date of tendering.

CCFAI = Variation factor for **PVC Compound** applicable depending upon type and size of the cable.

CCo = Price of PVC Compound

This price is as applicable on the 1st working day of the month, one month prior to the date of tendering.

AI = Price of EC grade aluminium rods (proper Zi rods)

This price is as applicable on the 1st working day of the month, two months prior to the date of delivery.

CC = Price of PVC Compound

This price is as applicable on the 1st working day of the month, two months prior to the date of delivery.

(*) Variation factor for Aluminum (AIF), PVC compound (CCFAI) for PVC Insulated Power cables, Steel (FeF) for PVC Insulated Power cables with Aluminum conductor is tabulated below.

TABLE – IV

VARIATION FACTOR FOR ALUMINIUM (AIF) POWER CABLES WITH ALUMINIUM CONDUCTOR

Nominal Cross Sectional Area (in Sq mm)	3.5 core
25 /16	0.262
35 /16	0.345
50 /25	0.478
70 /35	0.687
95 /50	0.949
120 / 70	1.221
150 /70	1.464
185 /95	1.861
225/120	2.287
240 /120	2.421
300 /150	3.033
400 /185	3.873

TABLE – V

VARIATION FACTOR FOR PVC COMPOUND (CCFAI) PVC INSULATED 1.1 KV POWER CABLES WITH ALUMINIUM CONDUCTOR

Nominal Cross Sectional Area (in Sq mm)	3.5 core	
	Unarm	Arm
25	0.422	0.444
35	0.489	0.515
50	0.613	0.645
70	0.707	0.744
95	0.908	0.927
120	1.024	1.045
150	1.289	1.315
185	1.499	1.530
225	1.840	1.878
240	1.990	2.031
300	2.361	2.409
400	2.616	2.669
500	3.687	3.762

(*) FeF = Variation factor for steel

Feo = Price of steel strips/steel wire. This price is as applicable on first working day of the month, one month prior to the date of tendering.

Fe = Price of steel strips/steel wire. This price is applicable on the first working day of the month, prior to the date of delivery.

TABLE – VI

VARIATION FACTOR FOR STEEL (FeF) PVC INSULATED 1.1 KV POWER CABLES WITH ALUMINIUM CONDUCTOR

Nominal cross sectional Area (in Sq mm)	3.5 core	Shape of armour
25	0.382	F
35	0.411	F
50	0.469	F
70	-	F
95	0.616	F
120	0.675	F
150	0.731	F
185	0.820	F
240	0.937	F
300	1.055	F
400	1.172	F
500	1.348	F

II PRICE VARIATION FORMULA APPLICABLE FOR ISOLATORS

a) Price variation calculation for Insulator Portion of Isolators :

$$P = \frac{Po}{100}\left\{15 + 5 \times \frac{Zn}{Zno} + 53 \times \frac{IN - INSLR}{INo - INSLR} + 27 \times \frac{W}{Wo}\right\}$$

Where in,

P - Price payable as adjusted in accordance with the above formula

Po - Price quoted/accepted

ZNo - Price of electrolytic high grade zinc.
This index number is as applicable on the first working day of the month, one month prior to the date of tendering.

INo-INSLRo = Index number for insulators based on relative prices and weightages (as given in brackets) of wholesale price index number for Fuel, Power, Light and Lubricants (28), wholesale price index number for basic metals, Alloys and Metal products (15), wholesale price index number for Wood and wood products (6), and Ball clay (4) calculated considering their values as on 1st January 2003 as base equal to 100.

This index number is as applicable on the first working day of the month, one month prior to the date of tendering.

Wo = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt of India (Base 1982 = 100).

This index number is as applicable on the first working day of the month, one month prior to the date of tendering.

ZN = Price of electrolytic high grade zinc.
This price is applicable on the first working day of the month, two months prior to the date of delivery.

INo-INSLR = Index number for insulators based on relative prices and weightages (as given in brackets) of wholesale price index number for Fuel, Power, Light and Lubricants (28), wholesale price index number for basic metals, Alloys and Metal products (15), wholesale price index number for Wood and wood products (6), and Ball clay (4) calculated considering their values as on 1st January 2003 as base equal to 100.

This index number is as applicable on the first working day of the month, one month prior to the date of delivery.

W = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt of India (Base 1982 = 100).

The above index numbers are as published by IEEMA vide circular reference number IEEMA (PVC)/INSLR. prevailing as on first working day of the month, four months prior to the date of tendering.

b) Price variation calculation for Metallic Portion of Isolators:

$$P = \frac{Po}{100}\left\{19 + 17 \times \frac{IS}{ISo} + 17 \times \frac{C}{Co} + 13 \times \frac{AL}{ALo} + 19 \times \frac{IN}{INo} + 15 \times \frac{W}{Wo}\right\}$$

Where in,

P - Price payable as adjusted in accordance with the above formula

Po - Price quoted/accepted

ISo - Wholesale price index number for ' Iron & Steel(Base : 1993-94 = 100).
This index number is as applicable for the week ending 1st Saturday of the month, three months prior to the date of tendering.

Co = Average LME settlement price of copper wire bars.
This price is as applicable for the month, two months prior to the date of tendering.

ALo = Price of Busbar grade Aluminium.
This price is as applicable on the 1st working day of the month, one month prior to the date of tendering.

INo = IEEMA index for insulator (Base: January 2003=100)
This index number is as applicable on the 1st working day of the month, one month prior to the date of tendering.

Wo = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt of India (Base 2001 = 100).

This index number is as applicable on the first working day of the month, four months prior to the date of tendering

IS = Wholesale price index number for "Iron & steel (Base: 1993-94=100)"

This index number is as applicable for the week ending 1st Saturday of the month, four months prior to the date of delivery.

C = Average LME settlement price of copper wire bars.

This price is applicable for the month, three months prior to the date of delivery.

AL = Price of Busbar grade Aluminum.
This price is as applicable on the 1st working day of the month, two months prior to the date of delivery.

IN = IEEMA index for insulator (Base: January 2003=100).
This price is as applicable on the 1st working day of the month, two months prior to the date of delivery

W = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt of India (Base 2001 = 100).

This index is as applicable on the first working day of the month, five months prior to the date of delivery.

The date of delivery is the date in which materials are notified as being ready for inspection/dispatch (in case absence of such notification, the date of manufacturer's dispatch note is to be considered as the date of delivery)

STATUTORY VARIATION:

It is the responsibility of bidder to inform himself of the correct rates of duties and taxes leviable on the equipment/material/Work at the time of bidding. If the rates of duties and taxes quoted in the bid are higher than the current rates of duties and taxes prevailing at the time of execution, the difference will be to the credit of APSPCL.

For Schedule-A any variation up or down in statutory levy or new levies introduced after tender calling date will be to the account of APSPCL as per the T.O.O. (CE-Construction-II) Ms No.12 Dt: 13-11-2013 of APTRANSCO.

In cases where delivery schedule is not adhered to by the supplier and there are upward variation / revision after the agreed delivered date the supplier will bear the impact of such levies and if there is downward variation / revision the APSPCL will be given credit to that effect. Forthe variations beyond the scheduled completion period the payment of taxes shall be limited to thetax rates applicable within the scheduled completion period.

In cases where the bidder assumes less tax rates and become lowest, upward variation oftaxes will not be considered.

In case of the bought out items for which the prices are quoted inclusive of GST, statutory variation shall not be applicable on that taxes and duties. For this purpose bought item means the material / equipment not manufactured by the bidder or either of Joint venture partners.

The bidder shall clearly mention the percentage of taxes and duties quoted by him under the Schedule-B (The rates in Schedule –A are excluding GST and Labour Cess etc., considered while quoting +/- tender percentage)

PAYMENT OF TAXES, LEVIES, DUTIES, STATUTES

Contractor shall be entirely responsible for payment of all taxes, levies, duties, license fees, etc., incurred until delivery of the contracted goods to the purchaser.

In respect of supply portion, the contractor shall pay all types of fees, levies, taxes, duties etc. required to be paid by any National or State statute, ordinance or other law or any regulation or bye-law of any local or other duly constituted authority in relation to the execution of works and by the rules and regulations of all Public bodies and companies whose property or rights are affected or may be affected in any way of the works. The contractor shall in compliance with the above keep the Purchaser indemnified against all such penalties and liability of every kind for breach of any statute, ordinance or law, regulation or bye-law.

Nothing in the contract shall relieve the contractor from his responsibility to pay any tax that may be levied by the Government on the turnover / profits made by him in respect of the contract.

The present rates of taxes and duties which have been considered in the estimate are mentioned in the Project Data Sheet. However it is the responsibility of the bidder to ensure the correct rate and any change of rate of taxes and duties at the time of quoting.

e.way bills-: For supply of material/equipment e-way bills are to be provided by the bidder only.APSPCL will not provided any way bills for the supplies against this tender unless there is clear instructions in this regard by the concerned authorities.

Reverse charge mechanism was not applicable in respect of purchase made from the composition dealer/registers dealer in case the service provider is an un registered dealer, the e-way bill will be issued by the APSPCL. The contractor must mention on the tax invoice if the tax is payable on reverse charge.

TAXES & CESS DEDUCTABLE AT SOURCES: As per provision of taxation act, necessary applicable taxes will be deducted at source at all stages of payment on the bills and same will be remitted to the concerned department as per the rules / acts of the State / Central Government. The present rates of the TDS are mentioned in the Project Data Sheet. However the deductions will be as per the rates prevailing as on the date of billing.

SEIGNORAGE CHARGES:
Seignorage charges have to be paid by the bidder to the Assistant Director Mines & Geology Department or the concerred , otherwise it will be deducted from the bills as per rules in vogue.

INSURANCE:
The prices quoted by the bidder shall include insurance charges for transit, storing and erection risks materials and insurance for labour as per the labour laws in vogue.

All the materials / equipment shall be insured by the contractor for loading, transit, unloading, storage and erection risks. Any insurance premium payable shall be borne by the contractor and shall cover the following risks also.

a) Full cover against damage to other people's property
b) Coverage against death or injury caused by the contractor's acts or omissions to:
    i. Anyone authorized to be on the site.
    ii. Third parties who are on the site.
c) Full cover against theft and damage to the works and materials during transit, storage and construction, till to the commissioning and handing over of the projectin full shape.

It is the entire responsibility of the contractor for the safety of all the materials / equipment and labours till the notified project / work are handed over to APSPCL aftercommissioning.

While doing the insurance for the workmen, the Contractors are advised to follow the labour department rules in vogue. Any additional insurance premiums if required duringthe course of project execution shall be borne by bidder.

All costs on account of insurance liabilities covered under this contract will be on contractor's account. The Contractor shall provide the purchaser with a copy of all the insurance policies and documents taken over by him in pursuance of the contract. Such copies of documents shall be submitted to the purchaser immediately after such insurance coverage. The Contractor shall also inform the purchaser in writing at least sixty(60) days in advance, regarding expiry, change, anymodification, amendments etc., Without prior approval of purchaser the Contractor shall not cancel any of the Insurance policies made for the project. It is the Contractor's responsibility to ensure revalidation or renewal of the insurance policies well in advance.

The bidder shall a) Initiate and pursue insurance claim till settlement and

b) Promptly arrange for repair and/or replacement of any damaged items in full irrespective of settlement of insurance claim by the under writers.

The Goods supplied under this Contract shall be fully insured against loss or damageincidental to manufacture or acquisition, transportation, storage, delivery and erection .In caseof domestic goods the insurance shall be at least for an **amount equal to 110% of the cost of the goods** from "warehouse to warehouse (final destination)" and **storage up to commissioning** thereafter on "All Risks" basis including War Risks and Strike Clauses.

In addition, the following provisions will apply to the portion of the 'Works' to be done by CONTRACTOR. Comprehensive Insurance of equipment/materials during erection and commissioning, Workmen's Compensation Insurance, Comprehensive Automobile Insurance and Comprehensive General Liability Insurance shall be the responsibility of the CONTRACTOR.

The Contractor shall also maintain an insurance policy against all claims which maybe made upon Purchaser whether under the Workmen's Compensation Act or any other statue in force during the currency of the contract or at common law in respect of any employee of contractor. The Contractor shall be responsible for anything which may be excluded from the insurance policies referred to above and also for all other damage to anyproperty or persons out of and incidental to the negligence or defective carrying out of this contract.

Third party Compensation: In particular, the Contractor shall effect and maintain an insurance policy of at least Rs.3.00 lakhs for one person and Rs.5.00 lakhs per accidental for injury or death and at least Rs.5.00 lakhs per accident for third party property damage, to indemnify purchaser against all third party accident/damage claims which may arise in respectof the work or in consequence thereof.

Workmen's Compensation Insurance: This insurance shall protect the CONTRACTOR against all claims applicable under the Workmen's Compensation Act, 1948 (Government of India). This policy shall also cover the CONTRACTOR against claims for injury, disability, disease or death of his or his SUB-CONTRACTOR's employees, which for any reason are not covered under the Workmen's Compensation Act, 1948. The liabilities shall not be less than :

Work Men's compensation -	As per statutory provision
Employees liability -	As per statutory provision.

Comprehensive Automobile Insurance: This insurance shall be in such a form to protect the CONTRACTOR against all claims for injuries, disability disease and death to members of public including the PURCHASER's men and damage to the property of others arising from the use of motor vehicles during on or off the 'Site' operations, irrespective of the purchaser-ship of such vehicles.

The liability covered shall be as herein indicated:	Rs. 1,00,000 each person
Fatal injury:	Rs. 2,00,000 each occurrence
Property damage :	Rs. 1,00,000 each occurrence

Comprehensive General Liability Insurance: This insurance shall protect the CONTRACTOR against all claims arising from injuries, disabilities, diseases or death of members of public or damage to property of others due to any Act or omission on the partof the CONTRACTOR, his agents, his employees, his representatives and SUB-CONTRACTORs from riots, strikes and civil commotion. This insurance shall also cover all the liabilities of the CONTRACTOR arising out of the clause entitled 'Clause. 31.0' of GCC Indeminify the Purchaser under 'General Conditions of Contract'.

The above are only illustrative list of insurance covers normally required and it will be the responsibility of the CONTRACTOR to maintain all necessary insurance coverage to the extent both in time and amount to take care of all his liabilities either direct or indirect, in pursuance of the 'Contract'.

It will be the responsibility of the Contractor to lodge, pursue and settle all claims with the Insurance Company in case of any damage, loss, theft, pilferage or fire and the Purchaser shall be kept informed about it.

ROYALTIES FOR PATENTS:

All royalties for patents or charges for the use of infringement thereof that may be involved in the construction or use of any material shall be included in the bid prices. The bidder shall protect the APSPCL against any and all such claims arising out on account of the use thereof.

The bidders are requested to consider all the applicable deductions and taxes & duties while quoting and no additional payment will be made if the bidder did not consider any of the

prevailing taxes and duties and deductions at the time of quoting.

3. SUPPLEMENTAL QUANTITES / ITEMS:

The quantities indicated in the Schedule-A (Works) are only provisional and are likely to change during actual execution. When quantities of any item are likely to exceed beyond 25% over and above the scheduled quantity or any new items / supplemental items arises, the Contractor shall bring the fact to the notice of APSPCL well in advance and take prior orders for going ahead with the work. Without approval of this office, the Contractor shall not go ahead with the work wherever there is increase in quantities exceeds beyond 25% over and above the scheduled quantities or any new items / supplemental items arises.

The contractor is bound to execute all Increased / supplemental / new items that are found essential, incidental and inevitable during execution of the contract at the rates to be workedout as below:

Increased Quantities:

I) For work items covered in Schedule-A:

a) **For quantities increased up to 25% over and above the Scheduled quantities:** The rates accepted for individual items shall hold good up to 25% over and above the agreement quantities.

b) **For quantities increased beyond 25% over and above the Scheduled quantities:** The rates payable for the quantities beyond 25% over and above the agreement quantities will be APSPCLestimated rate or accepted rate whichever is less.

For Supplemental / New Items:

i) For the items relating to the Schedule-A where the rate can be deduced from the estimate or APTRANSCO / DISCOMS / common SSR, the rate applicable will be the estimated / SSR rate +/- tender percentage quoted/ accepted by the bidder for Schedule – A. The schedule of rates adopted for supplemental items / new item will be from the SSR based on which the sanctioned estimate is prepared for calling of bids.

ii) For the items relating to the Schedule-A or Schedule-B where the rates of new items cannot be deduced from the estimate / SSR, the rate payable will be arrived based on the prevailing market rates duly enquiring / collecting quotations and observing the reasonableness of the rates by the Purchaser.

The contractor shall plan and procure the materials indicated in the schedule 'A' duly verifyingwith the approved layout , So that the procured quantities match with actual requirement to avoid excess supply of materials.

The Schedule time required to complete the new / supplemental items including the balancework will be indicated in the approval letter issued for new / supplemental items.

4. PERFORMANCE GUARANTEES

i) The contractor shall warrant for the satisfactory functioning of the materials / equipment

supplied and for the satisfactory operation of the workmanship performed by him, for a minimum period of '24 months from the date of commissioning of the project (Line / Sub-Station / Bay works etc)'. Where the suppliers/ Manufacturers provide longer period of warranty than mentioned above, the Purchaser shall be entitled for such longer warranty.Equipment, sub-assemblies or spares, or parts replaced / repaired under warranty shall have further warrantee of 24 months from the date of replacement / repair.

ii) After commissioning and handing over of the project to the APSPCL, the contractor shall arrange for thorough inspection during the first six months of the guarantee period sothat the defects if any noticed during that period may be rectified by the contractor free of costto the APSPCL without having to wait for the APSPCL to suggest such rectifications.

iii) If during the period of guarantee, the Engineer decide and inform in writing to the contractor that any equipment, part of equipment, material or works is defective, the contractor on receiving details of such defects or deficiencies shall at his own expense, irrespective of reimbursement of insurance company, rectify/replace the defective material or works within seven (7) days of his receiving the notice or within such reasonable time as APSPCL may deem proper for making it good. The decision whether correction of the defects should be through repair or by replacement shall be the sole discretion of the APSPCL.

iv) In the event of contractor not responding to the intimation of the Engineer as mentioned in above, the Engineer may arrange for a third party to correct the Defect and the extra costs for such corrections, shall be borne by the contractor as explained below.

v) The Engineer is to give the contractor at least seven (7) days notice of this intention to use a third party to correct a Defect. If the contractor does not correct the Defect himself within this notice period, the Engineer may have the Defect corrected by the third party. The cost of the correction will be deducted / collected from the Retention amounts or Performance / additional / Retention securities or amounts / bills pending to the contractor either in this contract or other contracts or any other Securities.

PERFORMANCE SECURITY:

The successful bidder shall furnish performance security equal to **Five percent (5%)** of the value of Work for the proper fulfillment of contract to cover the completion period plus 24 months guarantee period plus 2 months claim period .

If the successful bidder fails to furnish the performance security as specified above, the contract is liable for cancellation and forfeiture of the bid security. The performance security shall also be forfeited if the successful bidder fails to fulfill the terms of the contract.

Performance security may be made by Demand Draft on any approved Bank payable in favour of Chief Executive Officer/APSPCL.or by way of Bank Guarantee from approved Bank, in favour Chief Executive Officer/APSPCL. All Bank Guarantees, which are executed in accordance with this specification, shall be on a Stamp paper of value not less than Rs.100/- (Rupees one hundred only). Bank Guarantee executed on the stamp paper of value less than Rs.100/- will not be accepted.

ADDITIONAL SECURITY:

Tenders quoted abnormally less i.e. more than 15%, a B.G. obtained in favour Chief Executive Officer/APSPCL on the State Bank of India / Andhra Bank or any Nationalized Bank / Scheduled bank payable at Vijayawada for the difference between the tendered amount and 85% of the estimate value shall be furnished by the contractor invariably as additional security deposit. The period of validity of B.G shall be for a minimum period of six months. This B.G. shall not bear any interest. On successful completion of the work, the B.G. will be returned to the contractor. The period of validity shall be extended by the contractor from time to time till the B.G. is returned.

In case of contractors failing to complete the work at agreement rates, the B.G. furnished will be forfeited by the APSPCL.

The Performance and Additional Securities will be forfeited in the following cases.

i) When the successful bidder does not fulfills the obligations under the contract or provento be false submission of the information either in the bid or the information relating to the contract.
ii) When the successful bidder fails to execute the work in accordance with the clauses under this specification.
iii) When the successful bidder executing the work with in-ordinate delays or with poor quality which hampers the prime object of the contract, the securities will be en-cashed and will be adjusted towards such losses incurred by APSPCL or towards risk purchase.
iv) When the successful bidder pleads his inability to erect the Substation / Line and augmentation works and backs out of his obligations after issue of the preliminary acceptance letter or the letter of intent, the APSPCL will forfeit his performance/ additional/ bid securities and also recoverthe loss, if any, sustained by the APSPCL as a consequence of such backing out.In addition, the company will be blacklisted.

5. TERMS OF PAYMENT:

All the bidders who shall accept the following terms of payment are only acceptable. Bids received stipulating terms other than the following terms will be invalidated.

a) For Works:

i) Payments will be made up to 90% of the bills for the items of works completed during a month. For this purpose the contractor shall submit monthly bills to the Executive Engineer regularly to ensure payments in time. The contractor shall give fulldetails of items of works done against each location in support of the bill. Bills submitted without supporting details will not be taken into cognizance.
ii) Out of balance 10% amount, the first 5% payment will be released after completion of all the works, provided the material account is settled. The final 5% payment will be released after completion of the Guarantee period or on submission of a Bank Guarantee for the equivalent amount, valid for the guarantee period plus two months claim period, subject to settlement of material account.
    a) Certificate certifying that the defects, if any, pointed out during inspection have been rectified.
iii) No payments will be made for the supplies made prior to scheduled delivery date or for materials which are not in full shape.

iv) The payments against Schedule-A and B are subject to Performance Security with a validity of 24 months as on the date of completion of work/commissioning of project for proper fulfillmentof performance obligations.

5.1 Payments will be made by cheques by APSPCL. The contractor has to furnish requisite details for establishing RTGS in proforma as per Schedule -X. Once RTGS system is established, the bank account details submitted are final and cannot be changed till completion of the contract. An amount of Rs. 50/- will be recovered from the bill amount for each disbursement onLOA raised by unit officers towards RTGS.

6. COMPLETION PERIOD:

The over all completion period for this project is as per the Project Data Sheet. For completionperiod for individual works, refer Schedule-C. Within one week of receipt of intimation from

Superintending Engineer/Executive Engineer concerned, the contractor shall take over augmentation works site cum Electrical Layout for the Sub- station. Otherwise the date after one week of intimation to the contractor for taking over site cum Electrical Layout shall be the deemed date ofhanding over of profiles/Electrical layout and will be taken as date of commencement of work. **The detailed program for execution of works / supplies is enclosed in the Schedule**-C. The bidder shall execute all the works / supplies as per the program of works.

7. PENALTY FOR LATE SUPPLIES / COMPLETION**:**

The completion period mentioned in Schedule-C is the essence of contract. Penaltywill be levied as follows for the delay in executing the works or supply of material.

(a) For Works:

In case of delay in erection of the scheduled works after completion period mentioned in Schedule-C, whatever be the reasons, the APSPCL can levy and collect the penalty @0.5% per week of delay or part thereof.

However the sum of the penalties stated above are subject to a maximum of 5% of the total value of the contract. Once the maximum is reached, APSPCL may consider termination of the contract.

The right of the APSPCL to levy penalty shall be without prejudice to its rights under the law including the right to get the balance works executed by other agencies at therisk and cost of the successful bidder. This is in addition to the right of the APSPCL torecover any damages from the contractor and also blacklisting.

In case the successful bidder fails to execute the supplies/works as per the program or in the opinion of purchaser, the supplies/works are progressing at a slow pace, APSPCL reserves its right to get the balance or part of supplies/works executed through other agenciesat the risk and cost of the successful bidder, this is in addition to the right of the APSPCL to recover any damage from the contractor and also blacklisting.

8. PENALTIES IMPOSED FOR DEFICIENCIES IN QUALITY OF WORKS: **During**

executionof works, if any deficiencies in quality of works is found in deviation to the Specification/ Agreement, a minimum penalty of Rs.5000 to Rs.30,000/- shall be levied for deficienciesas per each category as mentioned below.

Category I : Not using (i) prescribed shoring, shuttering and dewatering equipment, (ii) measurement boxes, (iii) Form boxes for different types of foundations and steel measuring boxes, (iv) not providing adequate number of chairs to the steel reinforcements, (v) not carrying out back filling and compaction of the foundation pits in layers and leveling the tower footings properly, (vi) not ensuring that the excavated earth is dumped at least 2 meters away from the pit etc., and (vii) not providing copings to the tower legs/stubs (viii) not providing water tanker, Earth rammers/Earth vibrators.

Category II : Use of reinforcement steel other than TISCO, VSP and SAIL makes, not using vibrators for effective consolidation of the concrete during foundation works, not using proper templates for firmly keeping the stubs in position when templates are suppliedby the contractor & improper fixing of stubs, non ensuring of tower verticality, use of rusted stubs and tower parts if supply is by the contractor, non painting of butt joints and rusted stubs with zinc rich paint immediately after erection of the towers & stringing, non fixing of earth flat to the stub, non deployment of technical personnel for supervision of works by thecontractor. Also not fixing of vibration dampers firmly, repair sleeves wherever necessary, not properly fixing of arcing horns both tower side and line side and bird guards etc., as perspecification.

Category III : Use of improper grade / quality of raw material like H.B.G. metal, water and sand for concreting, using clogged and / or lump / clotted cement for concreting, not ensuring proper curing for foundation concrete, not ensuring that all the members of the tower are placed in position and firmly fixed with bolts and nuts immediately after erectionof tower, not ensuring that Half round seam welding of the nuts before stringing of the line.

For the above deficiencies in the quality of works noticed by the Engineer, penalties shall be levied as given below.

Type of category	First instance (Rs.)	Second instance (Rs.)	Third instance (Rs.)
Category I	5,000/-	10,000/-	15,000/-
Category II	7,500/-	15,000/-	22,500/-
Category III	10,000/-	20,000/-	30,000/-

In the event of fourth instance of noticing the deficiency of quality of works in any of the above categories, the bidder shall be debarred from participating **in future tenders for a minimum period of one year.**

9. EXTENSION OF THE COMPLETION DATE

When a work cannot be completed within the completion period indicated for reasons beyond the control of the contractor i.e. due to Force Majeure conditions mentioned below or due to the reasons attributable to APSPCL, the contractor shall represent for the same and extension of time without levying penalty shall be granted only on the issue of an undertaking by the contractor that they will not put forth at a later date, any claims for extra payments towards increased overheads, material/ equipment/works costs etc. during the extended period. It is the

sole discretion of the APSPCL to grant extension of completion period.

10. FORCE MAJEURE:

i) The Contractor will not be liable for forfeiture of its performance security, penalty for late delivery, or termination for default if and to the extent that its delay in performance or other failure to perform its obligations under the Contact is the result of an event of Force Majeure.

ii) For purposes of this clause, "Force Majeure" means an event beyond the control of the Supplier and not involving the Supplier's fault or negligence and not foreseeable. Such events may include, but are not restricted to, wars or revolutions, fires, floods, epidemics, quarantine restrictions, and freight embargoes.

iii) If a Force Majeure situation arises, within 15 days from the date of eventuality the Contractor shall notify the Purchaser in writing of such condition and the cause thereof. Unless otherwise directed by the Purchaser in writing, the Contractor shall continue to perform their obligations under the Contract as far as it is reasonably practice, and will seek all reasonable alternative means for performance not prevented by the Force Majeure event.

11. DELAYS ORDERED BY THE PURCHASER

APSPCL reserves the right to suspend and reinstate execution of whole or any part of the Works without invalidating the provisions of the contract. Orders for suspension or reinstatement of the Works will be issued by the Engineer to the Contractor in writing. The time for completion of the works will be extended suitably to account for duration of the suspension. Any costs incurred by the contractor due to increased overheads, idling of labour etc., as a result of such suspension will not be reimbursed to the contractor.

12. RESPONSIBILITY OF THE CONTRACTOR:

The successful bidder is responsible

a) For the safe delivery of the goods in good condition at destination and execution of the works ensuring quality. He should acquaint himself of the conditions obtaining in regard to supply of the materials.

b) To mobilize and plan for the labour and APSPCL shall not be responsible for any mismatch of work on account of whatever so the reasons and the successful bidder has to bear the costs towards ideal labour on account of mismatch of work if any.

c) To submit the work/ material bills, (preferably monthly for work bills and for materials immediately after receipt of them at site) promptly and submit all the required enclosures without fail. APSPCL shall not be responsible for any delayed payments whatever so the reasons.

The bidders are requested to study all the existing conditions and all the above aspects of the project while quoting itself and no extra claim will be entertained on the above reasons.

13. CLAIMS DUE TO DELAYS BEYOND CONTRACTOR'S CONTROL:

The contractor shall not be entitled to claim compensation on account of delays or hindrances to the works for any cause whatsoever. Should the cause of delay or hindrance not be the responsibility of the contractor, the CEO will consider whether it is possible or not to grant extension of time to compensate for this delay or hindrance. The contractor will not, however, be eligible for any compensation by way of increase in the

rates for the works executed beyond the contract period.

14. RECOVERY OF MONEY FROM CONTRACTOR IN CERTAIN CASES:

In every case in which provision is made for recovery of money from the contractor, the APSPCL shall be entitled to retain or deduct the amount thereof from any moneys that may be due or may become due to the contractor under these present and/or under any other contract or contracts or any other account whatsoever, including Bank Guarantees, Bid Security/Performance Security etc., held up by the APSPCL.

15. TERMINATION OF CONTRACT:

If it is found that Progress of works are not commensurate with the program of completion or if the contractor does not fulfill his obligations as per the terms of the specification APSPCL will be entitled to terminate the contract in part or full by giving 15 days notice and get the balance works completed through other agencies at the contractor's costand risk.

16. ARBITRATION

a) Any dispute or difference arising out of or touching the order based on this specification involving amounts upto Rs.50,000/- shall be decided by Chief Executive Officer/APSPCL through arbitration.

b) In case of disputes involving amounts more than Rs.50,000/-, the parties shall approach competent Civil Courts situated in Andhra Pradesh only, if necessary.

SCHEDULE - II

DETAILS OF TECHNICAL PERSONNEL OF THE BIDDER

Name of the Bidder/the partners

Sl. No.	Designation	Name & Qualifications Professional experience and details of workscarried out	Remarks
1	Construction Engineer		
2	Supervisory Staff		
i)			
ii)			
iii)			
iv)			

Signature of the Bidder
(Along with the seal)

SCHEDULE – III A

DETAILS REGARDING FINANCIAL STANDING OF THE BIDDER .

Name of the Bidder:

Sl. No.	Name of the Bank	Actual balance at credit of the contractor	Permissible overdraft / credit	Total credit	Bank Guarantee Limits	Remarks

The following particulars may be filled in.

Note:- Latest certificates from the Bankers in proof of cash balance and other credit facilities shall befurnished in support of the above information without fail.

Signature of the Bidder(Along with the seal)

SCHEDULE – IV A

DETAILS OF WORKS/CONTRACTS EXECUTED OF SIMILAR TYPE AND MAGNITUDE CARRIEDOUT BY THE BIDDER.

Sl. No	Name of the Line with full description such as Place & State	Length of the Line in km	Order Value	Date of award of contract	Period of completion as per Agreement	Period in which actually completed	Reasons for delay	Date of actual completion& actual cost of work	Principle features
	33KV								
	Total								

Name of the Bidder :

11KV

Total _____

33KVSS

Total _____

Note: Experience Certificates issued by the **order placing authority** shall be furnished by the bidder without fail, in support of the above information.

Signature of the Bidder(Along with the seal)

SCHEDULE - IV(B)

DETAILS OF FABRICATED AND SUPPLIED TOWERS/SUBSTATION STRUCTURES

Name of the Bidder/:

Sl. No.	Name of the work	Place andState	Quantity supplied	Period of supply	Principal features
1	2	3	4	5	6

Note: Experience Certificates issued by the **order placing authority** shall be furnished by thebidder without fail, in support of the above information.

Signature of the Bidder(Along with the seal)

SCHEDULE - V (A)

DETAILS OF ONGOING WORKS UNDER EXECUTION IN APTRANSCO / APSPCL

(as on the date of submission of the bid)

			Works on Hand				Works bidded-for		
Sl. No.	Name of the work/ Description	Place & State	Tendered cost in Rs.	Stipulated period of completion	Cost of remaining work	Anticipated date of completion	Estimated costin Rs.	Date when decision is expected	Stipulated date of completion
	132 KV 220 KV 33 KV								

Name of the Bidder:

I / We M/s…..... here by declared that the information furnished in respect of works under execution in the above said schedule is true to the best of my / we knowledge and belief. I / We hereby undertake that in the event of any of the above information found to be false or incorrect at a later date the APSPCL is entitled to reject the bid or terminate the contract agreement entered into besides black listing the bidder.

Signature of the Bidder(Along with the seal)

SCHEDULE – V (B)

DETAILS OF ONGOING WORKS UNDER EXECUTION IN OTHER THAN APTRANSCO/APSPCL
(as on the date of submission of the bid)

Name of the Bidder:

Sl. No.	Name of the work	Place and State of work execu-tion	Tender-ing authority / Organisa-tion name	Work on hand			Works tendered for			
				Contract valuein Rs.	Stipulated date of comple-tion as per contract & scheduled date of completion as per contract	Cost of remain-ing workas on date in Rs.	Anticipa-ted date of comple-tion	Estimat ed cost in Rs.	Date when decision is expected	Stipula ted date of compl e-tion
1	2	3	4	5	6	7	8	9	10	11
	132kV 220kV 400kV 33 kV SS &Lines									

Note: The bidder should submit details of all the works on hand invariably which should include the works being executed in other Departments and in other states. If any information found unfurnished or any information furnished in the bid is proven to be false at a later date, the bid will not only be rejected but the bidder will be black listed.

Signature of the bidder(Along with the seal)

SCHEDULE - V (C)

DETAILS OF ALL ONGOING WORKS UNDER EXECUTION / ALREADY AWARDED AND TOBE TAKEN UP (AWARDED BY

				Works on Hand				
Sl. No.	Name of the work/ Description	Place & State	Order Placing Utility /Authority	Order Value in Rs.	Value of Balance work (x)	Net Value of Balance work to be loaded	Remaining Stipulated period of completion	Whether Certificate issued by the State/Central Government Department / Undertakings enclosed
I	As an individual					x*1		
Total Value of existing commitment Rs.								

APSPCL & OTHERS UTILITIES)
Name of the Bidder :

I/We, Sri./Smt./M/s…… do here by solemnly affirm and declare that I/we have the balance works on hand as per the details furnished above are true and also declare that in case it is found at a later date to be false fake / incorrect, I/We …… will abide by any action such as rejection of the bid or disqualification or determination of contract under clause 60(a) PS to APSS or black listing or any action may deem fit .

Signature of the Chartered Accountant(Along with the seal) Date:
Place:

Signature of the Bidder(Along with theseal)
Date: Place:

SCHEDULE - V (D)

UNDER TAKING WITH REGARDS TO THE QUALIFICATION REQUIREMNTS

I. PHYSICAL EXPERIENCE:

The Physical Experience as per the Qualification Requirement is =

The above Qualification are meeting by considering the following works done by us (i)
(ii)
(ii)

Totals for each type of works. The relevant Certificates are to be attached.

Signature of the Bidder

Name: Designation:Seal:
Date:

Place:

SCHEDULE – VI

DETAILS OF GANGS AVAILABLE FOR ERECTION

Name of the Bidder:

Sl. No.	Name of the work under execution	Technical / supervisory staff	Skilled workers	Semi-skilled workers	Un-skilled workers
1	2	3	4	5	6

Signature of the Bidder(Along with the seal)

SCHEDULE-VII A

DETAILS OF VEHICLES AND TOOLS & PLANTS REQUIRED TO BE AVAILABLE WITH BIDDER

Name of the Bidder:

Sl. No.	Item of Work		Minimum requirements necessary	Available with the bidder
1	Excavation		General T&P	
2	Concreting	1	Theodolite	1
		2	Levelling Instruments	2
		3	Levelling staves	2
		4	Template leveling jacks	30
3	Earthing		Augurs	3
4	Tower/Structureerection	1	Pipe derricks	10
		2	Spanner sets, Manila/	Lot
		3	Nilon ropes	
		4	Pulley blocks	12
				1 Nos
5	Vehicles		Jeeps	
			Lorries	2 Nos
			Tractor	1 No.

Signature of the Bidder(Along with the seal)

SCHEDULE-VII B

Details of Vehicles and Tools & Plants Required to be available with Bidder

Name of the Bidder:

Sl.No.	Tools and Plants	Quantity
1.	Theodolite	1 No.
2.	a)leveling instrument with	1 No.
	b)leveling staffs	2 Nos.
	c)No.of flags	20 No.
3.	Welding machine with transformer gloves, shield and handle	1 Set
4.	Hand drilling machine	1 No.
5.	Steel measuring tape 15M	1 No.
6.	Steel measuring tape 30M	1 No.
7.	Column boxes for a height of 1 M	4 Nos.
8.	a) pin vibrator	1 No. + 1 no. spare
	b) Fan vibrator	1 No. + 1 no. spare
	c)Miller	1 No. + 1 no. spare
9.	Template leveling jacks	12 sets
10.	Rod bending tools (6mm to 20mm sizes)	1 set
11.	Radial drilling machine with drill bits upto20mm diameter	1 set
12.	Concrete mixer	1 No.
13.	Water pump with hose for curing	1 No.
14.	De watering pump	1 No.
15.	Derrick pole for erection of structures	1 No.
16.	Poly propylene ropes of each 20M minimum length	10 Nos.
17.	(a) Double end spanners of various sizes upto22mm diameter	1 set
	(b) Ring spanners of various sizes upto 22m diameter	1 set
	(c)Box spanners of various sizes	1 set
	(d) Screw drivers and cutting pilers	1 set
	(e) Equipment erection derrick pole 36' height	1 No.
18.	Tripod stand with chain pulley block of 3 Mtcapacity or arrangement to provide a crane having adequate boom length for erecting equipment	
19.	Traitor (2 Tonne) capacity	Complete set
20.	Gas welding and cutting	1 set
21.	Megger	1 set
22.	Crimping tools for cable termination	1 No.
23.	Drum lifting jack for mounting cable drums for unwinding cable	1 No.
24.	Safety belts for the workmen	Complete set
25.	Helmets for the workmen	Complete set
26.	Dynamo meter	Complete set
27.	Other necessary T & P required for complete execution of the work.	
28.	Vehicles :	
	a) Jeeps	1 No.
	b) Lorries	
	c) Tractor	1 No.

Note: Based on the studies carried out by the Engineer, minimum suggested major equipment to attain the completion of works in accordance with the prescribed construction schedule are shown in the above list.

Signature of the Bidder(Along with the seal)

SCHEDULE - VIII UNDERTAKING TO BE GIVEN BY THE BIDDER

I/We_____representing the Company/ Partnership Firm/Contractor responding to the bid invitation by the APSPCL vide Specification No. _____hereby sincerely and solemnly affirm and state as follows:

(Strike out whichever is not applicable)

(a) That myself or any of the representative of my Company/Firm do not have any relatives as deferred in appended Annexure in the APSPCL

OR

(b) That the following officers/employees of the APSPCL are related to me and to my representative of my Company/Firm and their status in the APSPCL is asunder:

S. No.	Name of the Officer/ Employee	Designation and Place of working	APSPCL	Relationship
1.				
2.				
3.				
4.				
5.				
6				

It is certified that the information furnished above is true to the best of my knowledge and belief. It is hereby undertaken that in the event of any of the above information found to be false or incorrect at a later date, the APSPCL/DISCOM is entitled to terminate the contract agreemententered into besides recovering damages as may be found necessary with due notice.

Signature of the Bidder(Along with the seal)

ANNEXURE TO SCHEDULE - VIII

LIST OF RELATIVES:

1. Father
2. Mother (including Step .Mother)
3. Son (including Step Son)
4. Son's Wife .
5. Daughter (including Step Daughter)
6. Father's Father
7. Father's Mother
8. Mother's Mother
9. Mother's Father
10. Son's Son
11. Son's Son's Wife
12. Son's Daughter
13. Son's Daughter's Husband
14. Daughter's Husband
15. Daughter's Son
16. Daughter's Son's Wife
17. Daughter's Daughter
18. Daughter's Daughter's Husband
19. Brother (including Step Brother)
20. Brother's Wife
21. Sister (including Step Sister)
22. Sister's Husband.
23. Son's Wife's Father
24. Son's Wife's Mother
25. Daughter's Husband's Father
26. Daughter's Husband'sMother

SCHEDULE - IX

PROFORMA FOR SELF DECLARATION

(To be uploaded invariably along with bid documents)

Name of the work: Augmentation of 220/33kV Pooling Substation-2: Supply, Erection including civil works, Testing and Commissioning of 2 Nos. 220/33kV Power Transformers Bays at Galiveedu site of Ananthapuramu Ultra Mega Solar Park (1500 MW), A.P.

Tender Notice No. APSPCL-e-E-27/2021-22/EE/Tech/APSPCL, Dt.26.05.2022

****

I/We …… (Name and designation) authorized signatory of the tenderer, M/s ……. (hereinafter called the tenderer) for the purpose of the Tender documents for the work of as per the tender No._____ do here by solemnly of firm and state on the behalf of tenderer including its constituents as under:

1) I/We the tenderer(s) am / are signing this document after carefully reading the contents.
2) I/We the tenderer(s) also accept all the conditions of the tender and have signed all the pages in confirmation thereof.
3) I/We hereby declare that I/We have downloaded the tender document from AP e-procurement portal. I/we have verified the contents of the tender document from the website and uploaded the required documents as per the tender specifications.
4) I/We hereby declare that I/We are fully qualified and eligible to bid for the work as per the eligibility criteria given in the tender notice.
5) I/We hereby declare that I/We have got the following minimum eligible criteria to bid for the work

   i) The bidder should have valid 'A" Grade electrical license issued / recognized by **the Government for** executing the electrical works related to Extra High voltages.
   ii) The firm should have valid registration from registrar of firms or register of companies.
   iii) Experience:
   The bidder should have executed at least the following works in the last 10 years as a prime contractor/as a lead partner for qualifying the notified work.
      a) Supply, erection, testing and commissioning of 2 no's 220 kV bays or 1. No .132KVSubstation to any Govt. Power utility/ PSU in India.
      b) The above works shall be Successful operation for at least one year. The bidder shall enclose the proof of successful operation of 1 year.
   iv) **Liquid asset/credit facilities/Solvency certificate** (not older than 12 months from the date of availability of tender specification on e-procurement platform) issued by any Indian Nationalized Bank or scheduled bank of value not less than 50% of estimated contract value.
   v) The bidder should have aggregate turnover of 3 times of estimated contract value during last three preceding financial years put together i.e. from FY 2018-19 to FY 2020-21. The bidder shall submit annual turnover certificate duly certified by Chartered Accountant (CA).
   vi) Online Payment of EMD for an amount Rs.5,49,407/- @ 1% of ECV (Rupees Five Lakhs Forty Nine Thousand Four Hundred and Seven Only) shall be 180 days from the date of bid opening).
   vii) All terms & Conditions of the Tender Specification

6) I / we declare and certify that I / We have not made any misleading or false representation in the forms, statements and attachments in proof of the qualification requirements.

7) I/we also understand that my / our offer will be evaluated based on the documents / credentials submitted along with the offer and same shall be binding uponme/us.

8) I/wedeclarethattheinformationanddocumentssubmittedalongwiththetenderbyme/usare correctandI/wearefully responsible for the correctness of the information and documents submitted by us.

9) I/we understand that any of the certificates regarding eligibility criteria submitted by us are found to be forged / false or incorrect at any time during process for evaluation of tenders and afterwards, it shall lead to forfeiture of tender EMD besides my / our offer shall be summarily rejected. I understand that the bidder will be suspended from participating in the tenders on e-procurement platform for a period of 3 years. The e-procurement system would deactivate the user ID of such defaulting bidder based on the trigger/ recommendation by the Tender Inviting Authority in the system. Besides this, the department shall invoke all processes of law including criminal prosecution of such defaulting bidder as an act of extreme deterrence to avoid delays in the tender process for specified work/materials.

10) I/we also understand that if any of the certificates submitted by us are found to be false / forgedor in correct at any time the award of the contract, it will lead to termination of the contract, along with forfeiture of EMD and10% of Performance Bank Guarantee besides any other action mentioned above.

11) I/We agree to keep the offer of this tender valid for a period of 180 days from the date of opening of tender and not to modify the whole or any part of it for any reason within the above period. If the tender is withdrawn by me/us for any reason whatsoever, within the validity period, the earnest money deposited by me/ us will be forfeited to APSPCL.

12) I/We hereby distinctly and expressly declare and acknowledge that, before the submission of my/ our tender, I/We have carefully followed the instructions in the tender notice and have read the APSS and the Preliminary specifications therein.

13) I/We have not been black listed in any department due to any reasons.

14) I/We have not been demoted to lower category in any department for not filing the tenders after buying the tender schedules in a whole year and their registration had not been cancelled for a similar default in last two consecutive years.

15) I/We will agree to get disqualified themselves for any wrong declaration in respect of the above and get their tender summarily rejected duly forfeiting the EMD.

16) The soft copies uploaded by me/us are genuine. Any incorrectness / deviation noticed can be viewed seriously and apart from canceling the work duly forfeiting the Bid security, including suspension of business and/ or black listing.

17) The quoted price is exclusive of GST.

Signature of the bidder
With seal

SCHEDULE -X

BANK ACCOUNT DETAILS FOR RTGS

1.	Name of the Bank	:
2.	Name of the Branch	:
3.	Branch Code	:
4.	City	:
5.	Account No.	:
6.	MICR No.	:
7.	IFSC No.	:
8.	Income Tax PAN No.	:
9.	VAT Registration No.	:
10.	Date of VAT Registration	:
11.	Place of VAT Registration	:

Signature of the Bidder

SCHEDULE –XI CHECK LIST

Only **Positive** Confirmations on the following will make the bid responsive.
Indicate **Yes/No**

1	State whether the work / materials offered conforms to the relevant APSPCL / ISS Specifications and drawings. (If not Specify theDeviations in Annexure)	
2	State whether Qualification and Performance particulars are uploadedalong with necessary performance certificates in PDF formats.	
3	State whether copies of 'Tax Deducted at Source' certificates are uploaded with proper attestation in PDF formats.	
4	State whether copy of 'GST Registration Copy' are uploaded with proper attestation in PDF formats.	
5	State whether copy of 'A-Grade license certificate' issued by CEIG is uploaded with proper attestation in PDF formats.	
6	State whether copy of 'Income Tax registration / PAN registration certificate' are uploaded with proper attestation in PDF formats.	
7	State whether complete Quantity is quoted. (Bidder must quote for 100% of quantities of all items)	
8	State whether scanned copy of Online payment receipt for Bid Security is uploaded in PDFformat.	
9	State whether Clause 1.0 of Section II Financial is accepted.	
10	State whether Bid Validity is offered as per specification.	
11	State whether APSPCL Payment Terms are accepted.	
12	State whether APSPCL 's completion period & Penalty Clause isaccepted.	
13	State whether APSPCL's Delivery Schedule / Completion period isaccepted.	
14	Are you prepared to furnish Performance Security B.G. if order is placed?	
15	State whether APSPCL's Guarantee Clause is accepted.	
16	State whether Bid form uploaded	
17	State whether Bank's Certificate for availability of Credit facilities areuploaded	
18	State whether all the Schedules (I to X and D& E) are uploaded.	
19	State whether the Guaranteed Technical Particulars for Section-2 toSection -6 of technical Specification are uploaded	
20	State whether copies of type test certificates for equipment/materials are uploaded.	
21	State whether all the clauses are accepted.	
22	State whether prices Schedule –A and C are uploaded in XL file.(Commercial schedules)	
23	State whether the total lump sum amount quoted in Bid form is as per schedule-C	

Signature of Bidder(Along with the seal)

.

(A) PERFORMANCE SECURITY FORM

To:_____(Name of Purchaser)

WHEREAS……(Name of the Contractor/ Company) (hereinafter called "the Contractor") has undertaken, in pursuance of Contract No.....dated.....200 to supply/erect …….(Description of work)
(hereinafter called "the Contract").

AND WHEREAS it has been stipulated by you in the said Contract that the contractor will furnish you with a Bank Guarantee by a recognized Bank for the sum specified therein as security for compliance with the Contractor's performance obligations in accordance with the Contract.

AND WHEREAS we……..(Name of the Bank with full address) have agreed to give the Contractor a Guarantee.

THEREFORE WE hereby affirm that we are Guarantors and responsible to you, on behalf of the Contractor, up to a total of Rs.....(Amount of the Guarantee in Words and Figures)
and we undertake to pay you, upon your first written demand declaring the Contractor to be in default under the Contract and without cavil or argument, any sum or sums within the limit of Rs..... (Amount of Guarantee) as aforesaid, without your needing to prove or to show grounds or reasons for your demand or the sum specified therein.

This guarantee is valid until the. ... day of 2022 .

Signature and Seal of Guarantors
.....Date. .....2022 .
.....
.....Address:.....…...
.....
.....

NOTE: This will be executed on a Rs.100/- non-judicial stamp paper by a scheduled Bank.

(B) BID FORM

Date. .....
TO: (Name and Address of Purchaser)Gentlemen and/or Ladies:

Having examined the Bidding documents, the receipt of which is hereby duly acknowledged, we, the undersigned, offer to execute ..... (Description of Work) in conformity with the said bidding documents for the sum quoted by us or such other sums as may be ascertained in accordance with the schedule of prices attached herewith and made part of this Bid.

We undertake, if our Bid is accepted, to complete the work in accordance with the completion period specified in the Schedule-D.

If our Bid is accepted, we will submit the Performance Bank Guarantee as per specificationfor the due performance of the Contract, in the form prescribed by the Purchaser.

We agree to abide by this Bid upto ……. (for the Bid Validity Period) specified in Clause ( ) and it will remain binding upon us and may be accepted at any timebefore the expiration of that period.

Until a formal contract is prepared and executed, this Bid, together with your written acceptance thereof and your notification of award, will constitute a binding Contract between us.

We understand that you are not bound to accept the lowest or any bid you may receive.

We certify / confirm that we comply with the eligibility requirements as per clause ( ) of the bidding documents.

Dated this. .....day of.....2022

_____

_____

[Signature]
[in the capacity of]

Duly authorized to sign Bid for and on behalf of …….

(A) FORMAT FOR BANK'S CERTIFICATE TOWARDSAVAILABILITY OF CREDIT FACILITIES

BANK CERTIFICATE

This is to certify that M/s._____(Full Name & Address)_____who are submitting their bid to ANDHRA PRADESH SOLAR POWER CPORATION PRIVATE LIMITED against their Bid specification vide ref. No._____& dated_____.

M/s._____is our Customer for the past _____ years. Their financialtransactions with our Bank have been satisfactory. They enjoy the following fund based and non fund based limits including for guarantees, L/C and other credit facilities with us against which the extent of utilization as on date is also indicated below:

Sl.No.	**Type of Facility**	**Sanctioned Limit as on Date_____**	**Utilisation as on Date _____**

This letter is issued at the request of M/s._____.

Sd/-
Name of Bank_____
Name of Authorised_____
Signatory_____
Designation_____
Phone No._____
_____

Address_____

SEAL OF THE BANK

LIST OF APPROVED MANUFACTURERS

1)	Steel Brands for usein Reinforcement and for Structures & Towers		**1**) VSP **2**) SAIL and **3**) TISCO
2)	Cement Brands		**1**) ACC Limited **2**) Kesoram Cements **3**) Orient Cements **4**) Zuari Cements **5**) CCI Limited **6**) Andhra Cements **7**) Coramandel Cement **8**) Raasi Cement **9**) Sri Vishnu Cements **10**) Madras Cements **11**) Ultra Tech Cement Limited – APCW **12**) KCP Limited **13**) Penna Cements **14**) Panayam Cement **15**) Grasim **16**) Rajashree Cement **17**) Mysore Cement **18**) Century Cement **19**) Ambhuja Cement and **20**) Priya Cement 21). Bharati Cement

LIST OF APPROVED MANUFACTURERS

Sl. No	**Material / Equipment**		**Name of the Manufacturer**
1)	Transmission Line Towers and Sub Station Structures fabricators	i)	M/s. Bajaj Electricals Ltd., Mumbai
		ii)	M/s. RPG Transmission Ltd., New Delhi
		iii)	M/s. Jyothi Structures Ltd., Mumbai
		iv)	M/s. BS Transcom, Hyderabad.
		v)	M/s. KEC International Ltd., Mumbai
		vi)	M/s. Kalpataru Power Transmission Ltd., Gandhinagar
		vii)	M/s. Hyundai Electrical Transmission Ltd., Gurgaon
		viii)	M/s. Sujana Towers Ltd., Hyderabad
		ix)	M/s. Deepak Galvanising & Engg. Indus. Pvt. Ltd., Hyderabad
		x)	M/s. Sangam Structures Ltd., Allahabad
		xi)	M/s. ICOMM Tele Ltd., Hyderabad
		xii)	M/s. Aster Teleservices Pvt. Ltd., Hyderabad
		xiii)	M/s. Hyderabad Steels Ltd., Hyderabad
		xiv)	M/s. R.S Engineering Co.., Hyderabad
		xv)	M/s. Venkateswara Fabricators Ltd., Hyderabad
		xvi)	M/s. Vertex Engineers., Hyderabad
		xvii)	M/s. Kusuma Enterprises, Hyderabad
		xviii)	M/s. K.Ramachandra Rao Transmission & Projects Pvt.Ltd., Hyd.
		xviv)	M power Infratech (India) private Ltd Cherpali, Hyderbad.
Note: All approved vendors of APTRANSCO are acceptable			

LIST OF THE APPROVED BANKS FOR ISSUING BG

S.No.	NAME OF THE BANK
1	Allahabad Bank
2	Andhra Bank
3	APCO. Bank, Main Branch, Hyderabad.
4	Bank of Baroda
5	Bank of India
6	Bank of Maharashtra
7	Bank of Punjab Ltd
8	Central Bank of India
9	Centurion Bank Ltd
10	City Bank
11	Corporation Bank
12	Federal Bank
13	HDFC Bank,
14	HSBC BANK
15	I.C.I.C.I Bank
16	I.D.B.I. Bank
17	Indian Bank
18	Indian Overseas Bank
19	ING Vysya Bank Ltd
20	Karnataka Bank
21	Karur Vysya Bank
22	Kotak Mahindra Bank
23	Lakshmi Vilas Bank
24	Oriental Bank of Commerce
25	Punjab National Bank
26	Standard Chartered Bank
27	State Bank of India and other State Bank Group Banks / Associate Banks.
28	Syndicate Bank
29	U.T.I. Bank Ltd
30	Union Bank Of India
31	Vijaya Bank
32	YES Bank Ltd
33	Development Credit Bank

COMPLETION PERIOD - SCHEDULE – E

APSPCL-e-E-27/2022-23/EE(Tech)/APSPCL, Dt.26.05.2022

Program of execution:

The successful bidder shall execute the work as per the program given in bar charts for each work.

The overall completion period of the project is as per the Project Data Sheet. The commencement date of the Project will be reckoned *from the date of issue of detailed Contract award letter*. If the tender involves multiple works like transmission lines and substation works, the single completion period mentioned in the following table shall be considered.

Sl. No.	Description of work	Completion period
1	Augmentation of 220/33kV Pooling Substation-2: Supply, Erection including civil works, Testing and Commissioning of 2 Nos. 220/33kV Power Transformers Bays at Galiveedu site of Ananthapuramu Ultra Mega Solar Park (1500 MW), A.P.	08 Months

I/We agree to the above mentioned completion period.

Signature of the Bidder/Lead Partner

(Along the seal)

PROJECT DATA

<table>
<tr><td>1.</td><td>Name of the Project / work</td><td>:</td><td>Augmentation of 220/33kV Pooling Substation-2: Supply, Erection including civil works, Testing and Commissioning of 2 Nos. 220/33kV Power Transformers Bays at Galiveedu site of Ananthapuramu Ultra Mega Solar Park (1500 MW), A.P.</td></tr>
<tr><td>2.</td><td>Location</td><td>:</td><td>Galiveedu in YSR Kadapa District.</td></tr>
<tr><td>3.</td><td>Post, Telegraph & Telephones</td><td>:</td><td>Galiveedu</td></tr>
<tr><td>4.</td><td>District, Mandal</td><td>:</td><td>YSR District</td></tr>
<tr><td>5.</td><td>Medical Aid</td><td></td><td>Galiveedu in YSR Kadapa District.</td></tr>
<tr><td>6.</td><td>Bid Inviting Authority</td><td>:</td><td>Executive Engineer/Tech/APSPCL, Tadepalle, Guntur District, A.P</td></tr>
<tr><td>7.</td><td>Master Copy of the Bid Specifications available at</td><td>:</td><td>Executive Engineer/Tech/APSPCL, Tadepalle, Guntur District, A.P</td></tr>
<tr><td>8.</td><td>Rates of Taxes adopted</td><td>:</td><td>Schedule A: GST = 18%(CGST 9%+SGST 9%) on works contract

Schedule B: Labour Cess =1% on Gross value of Labour. GST =18% on total Labour including Labour Cess</td></tr>
<tr><td>9.</td><td>Present Rates of Tax Deductions in the Bills</td><td></td><td>Income Tax = 2%, Labour Cess on work bills = 1%, GST and Seignorage charges as per govt rules in vogue.</td></tr>
<tr><td>10.</td><td>Basic Data for Price Variation</td><td></td><td>The Basic rate of reinforcement steel and cement as taken in the estimate were as informed by Government i.e., Rs.60,000/- per MT of Reinforcement steel, and Rs 3680/- per MT of Cement and Cement Rate for the YEAR' SSR-2021-22 and Steel Rates for the Month of Nov' 2021) .

The Basic rate of Transmission Line Tower Parts, Substation Structures and Earth Flat as taken in the estimate were exclusive of all taxes & duties and transportation charges.
<table>
<tr><th>Sl. No.</th><th>Material</th><th>November-2021</th></tr>
<tr><td>1</td><td>Galvanised Transmission line towers per MT (Including Fabrication & Galvanization charges)</td><td>Rs 98,964/-</td></tr>
<tr><td>1</td><td>Galvanised substation structures per MT</td><td>Rs 89,207/-</td></tr>
</table>
</td></tr>
</table>

			(Including Fabrication & Galvanization charges)	
			2	M.S. Flat per MT	Rs. 55,000/-
			3	GI Flat per MT (Including Galvanization charges)	Rs. 75,880/-
11.	Completion Period of the Project.		Refer Schedule E		
12.	Financial Tie up / Funding	:	APSPCL		
13.	Any amendments / deviations given to the Standard Bid Documents.		Will be furnished in Special Conditions of the Contract.		

Name of the Work:-Augmentation of 220/33kV Pooling Substation-2 - Supply, Erection , Testing and Commissioning of 2Nos 220/33KV PTR Bays at 220/33kV Pooling Substation -2, Galiveedu site of Ananthapuramu Ultra Mega Solar Park (1500 MW)

ABSTRACT

Sl.No	Description	Amount Excluding Taxes & Duties GST(Rs.)
1	Sch A Supply Portion	**28,216,098.73**
2	Sch B Erection Electrical Portion	**2,784,880.93**
3	Sch C Civil Portion	**23,666,355.00**
4	Sch D Project Insurance	**273,336.67**
	Total:	**54,940,671.33**

Schedule-A (Supply of Material)

Name of the Work:-Augmentation of 220/33kV Pooling Substation-2 - Supply, Erection , Testing and Commissioning of 2Nos 220/33KV PTR Bays at 220/33kV Pooling Substation -2, Galiveedu site of Ananthapuramu Ultra Mega Solar Park (1500 MW)

S.No.	DESCRIPTION OF ITEM	UOM	Qty	Unit Rate (Rs.)	Total (RS.)
1	GI Structures	MT	35	93226.72	3262935.20
2	G.I Bolts &Nuts	MT	1.7	80705.43	137199.22
3	Supply of 120 kN disc Insulators	No.	350	563.75	197312.50
4	Supply of 70 kN disc Insulators	Nos.	180	302.38	54427.50
5	Supply of ACSR Moose Conductor	K.M	1	333125.00	333125.00
6	220KV Circuit Breakers	No.	1	1332500.00	1332500.00
7	220KV Power transformer CTs(500-300A/1-1-0.66,1-0.5,1-1A)	No.	3	251125.00	753375.00
8	220KV LAs	No.	3	46125.00	138375.00
9	220 kv 800A Isolator without E/S	No.	2	123307.50	246615.00
10	Supply of 220 kV solid core Insulators	Nos.	18	23062.50	415125.00
11	Supply of Bus Post Insualators	Nos.	2	22759.10	45518.20
12	Supply of 33 kV solid core Insulators	Nos.	6	1947.50	11685.00
13	5 Bolted twin moose tension hardware with 400mm spacing for 220KV bus	Sets	12	3997.50	47970.00
14	5 Bolted Single Tension hardware for for single moose for 220KV&132KV Bus	Nos	12	1947.50	23370.00
15	Spacer clamps for twin moose with 400mm spacing	No	30	457.15	13714.50
16	Supply of LTAC Panel	No	1	169125.00	169125.00
17	Sinlge Moose Conductor Support through clamps suitable for 220KV Solid Core Insualtors/Bus Post Insualtors	Nos	4	563.75	2255.00
18	T- Clamps for twin moose of 400mm spacing to single moose Take off	Nos	12	724.68	8696.10
19	Supply of Earth Bonds	Nos	56	307.50	17220.00
20	Supply of Bolted type Earth wire tension clamp with Earth Bond	Set	20	604.75	12095.00
21	Pad type compressor clamp for GS Earth wire to 100*16 mm Flat	Nos.	5	82.00	410.00
22	Intel core i-7-3920XM Process 512KB level-8M cache upto 3.80 GHz, 8GB RAM , 128bit graphic accelerator with 4MB SG RAM,160GB Ultra DMA-HDD,1.44MB FDD,52X Creative DVD-ROM,1x16550 fast serial ports & IEPP ECP parallel ports , 4X, universal serial bus (USB) ports, PS/2 compatible key board/mouse ports, 19" colour monitor, Internet ready multimedia key board, Optical scroll mouse and built in modem 128KBPS along with telephone instrument & other accessories and complete installation of the system, DVD writer with latest software. (HP / ACER make or equivalent reputed make	Nos.	1	69404.80	69404.80
23	PG Clmaps for Moose	Nos.	75	492.00	36900.00

S.No.	DESCRIPTION OF ITEM	UOM	Qty	Unit Rate (Rs.)	Total (RS.)
24	Supply of Moose T clamps (all three ways)	Nos.	12	615.00	7380.00
25	Suspension Hardware for Twin Moose(Pilot SS type)	Nos.	6	1135.70	6814.20
26	Supply of Marshlling Box suitable for CT etc.,(220/132/33 KV)	Nos.	2	4084.63	8169.25
27	Supply of Lighting pillar box	No.	1	8223.58	8223.58
28	Supply of 7/3.15mm HTGS Earthwire	K.M	1	26137.50	26137.50
29	Supply and Erection of LED lamps	Nos.	7	5851.73	40962.08
30	**Supply of following Control cables**			0.00	0.00
a	2.5 Sqmm 2 core copper cable	K.M	2	40021.13	80042.25
b	2.5 Sqmm 4 core copper cable	K.M	4	61794.18	247176.70
c	2.5 Sqmm 6 core copper cable	K.M	1	91664.73	91664.73
d	2.5 sqmm 10 core Copper cable	K.M	1	146279.80	146279.80
e	2.5 Sqmm 12 core copper cable	K.M	4	172048.30	688193.20
31	supply of power cable of size 70 sqmm 3 1/2 core Alluminum cable (Finolex / Unicab / Arrow make)	K.M	0.5	255360.30	127680.15
32	Design ,Supply ,testing and comissionning of 33kV, AIS (AIR INSULATED SWITCHGEAR) Indoor switchgear panels along with Bus bar, CTs,PTs etc.,complete as per the Technical specification and single Line diagram in all respects to satify the scheme and comprising of following including BCPU as per BOM with IEC 61850 protocal: NOTE 1: Accuracy class& Burden of CTs shall be designed to match the requirement. NOTE 2: Accuracy class& Burden of PTs shall be designed to match the requirement. NOTE 3: Main& Back up protection shall be provided. NOTE 4: Complete switch gear panels shall be SAS compatible. NOTE 5: Metering instruments such as ammeter, voltmeter& TVM etc shall be provid . a) for 10 nos feeders with main and check CT with 0.2 S CL 5VA and for PTs 02 CI 10 VA burden . The bidder shall furnish prices for metering			0.00	0.00
a	33KV 2500A 31.5 KA HT Panels for Transformer	Nos	1	1399253.63	1399253.63
b	33KV 2500A 31.5 KA HT Panels for Bus Couplers	Nos	1	1399253.63	1399253.63
c	33KV 1600A 31.5 KA HT Panels for Incoming feeders and Aux.Transformer (In revised schdule price of panel taken as Rs. 12,58,437.93)	Nos	5	1134767.03	5673835.17
d	33KV Bus Raiser cum PT panels	Nos	1	753682.80	753682.80
33	Supply of 33KV 400Sqmm 1 Core Copper XLPE	KM	2	2966657.50	5933315.00
34	Supply of 33KV, 1cx400Sqmm, XLPE UG cable heat shrinkable cable jointing kits suitable for indoor breakers.	Nos	24	6279.41	150705.75

S.No.	DESCRIPTION OF ITEM	UOM	Qty	Unit Rate (Rs.)	Total (RS.)
35	**Material/Equipment for Substation Automation System**			0.00	0.00
a	220/33kV, 80 MVA Power Transformer Control & Relay Panels with BCUs both on H.V and L.V side as per BOM	Nos.	1	1116329.55	1116329.55
b	BCPUs along with LIUs, Ethernet switches, Patch cords etc as per BOM for 33kV Switchgear panels for integration with SAS system	Nos.	5	71750.00	358750.00
c	BCPUs along with LIUs, Ethernet switches, Patch cords etc as per BOM for 33kV Bus coupler panel for integration with SAS system	Nos.	1	71750.00	71750.00
36	30kV, 10kA Lightning arrester along with terminal connectors to suit ACSR Single Moose	No	3	3452.20	10356.60
37	Supply of heat shrinkable end termination kits for 33KV, 1cx400Sqmm, XLPE Copper cable (Out door)	Nos.	24	6131.73	147161.63
38	Supply of heat shrinkable end termination kits for 33KV, 1cx400Sqmm, XLPE Copper cable (indoor)	Nos.	24	6131.73	147161.63
39	4" IPS AL Tube	mtr	12	2087.49	25049.93
40	Carona Bell to suit 4" IPS AL tube.	No	6	580.70	3484.22
41	Clamps to Suit 33KV 1C X 400 Sqmm XLPE Copper Cable to 4" IPS AL Tube	No	12	1495.97	17951.60
42	clamps to Suit 4" IPS AL Tube to Twin moose ACSR with 400mm Spacingv	No	3	2308.42	6925.27
43	BPI Clamps to suit 4" IPS AL Tube rigid type	No	6	1062.23	6373.37
44	16mm U Bolt	No	40	143.50	5740.00
45	**Supply of Earth Flat**			0.00	0.00
i	75X8 mm MS Flat	RM	4725.00	278.00	1313550.00
ii	100X16 mm MS Flat	RM	199.50	815.00	162592.50
iii	75X8 GI Flat	RM	700.00	376.00	263200.00
iv	100X16 mm GI Flat	RM	400.00	1104.00	441600.00
	Total				**28,216,098.73**

Schedule-B (Erection Portion)

Name of the Work:-Augmentation of 220/33kV Pooling Substation-2 - Supply, Erection , Testing and Commissioning of 2Nos 220/33KV PTR Bays at 220/33kV Pooling Substation -2, Galiveedu site of Ananthapuramu Ultra Mega Solar Park (1500 MW)

Sl.No	Description of Work	UOM	Qty	Unit Rate (Rs.)	Total (Rs.)
1	Setting of stub with stub setting template for stubstation structure: erection of stub template, fixing of jacks for supporting the tempalte, alignment and levelling of exact location of stubs of stub setting template, dismantling of template after completion of curing of CC				
1-a	For 220 kV Towers	set	14.00	4813.96	67395.43
1-c	For CPL structures& BPI Structures	set	28.00	863.07	24166.04
1-d	For 220KV Isolator structures	set	4.00	3611.18	14444.73
1-e	For 220KV Breakers	set	1.00	3122.81	3122.81
2	Erection of main and auxiliary structures etc., using Bolts and nuts(i.e. inclusive of bolts & nuts)	MT	28.00	3729.26	104419.42
3	Hoisting insulators & hardware stretching the conductor and stringing of 220 KV bus comprising of three phases with Twin Moose conductor to a tension of 1800 Kgs. including fixing of spacer clamps (The approximate length of bus section will be 40m.)	Each	4.00	14914.20	59656.78
4	Hoisting of Insulators, Hardware, Stretching the conductor and Stringing of 220kV Bus comprising of three conductors with Single Moose conductor to a tension of 900kgs(The approximate length of bus-section will be 45 mtrs.)	Each	2.00	7455.63	14911.27
5(a)	Fixing of Hard ware, stretching the conductor and stringing of earth wire to a tension of 450kgs from pinacle to pinacle inculding fixing of tension clamps.	Each	10.00	1113.82	11138.23
6(b)	Fixing of Hard ware, stretching the conductor and stringing of earth wire to a tension of 450kgs from pinacle to ground inculding fixing of tension clamps.	RM	100.00	75.80	7580.43
7(a)	Connecting equipment to bus and/or another equipment with single Moose conductor including measuring, cutting, clamping and also hoisting of suspension insulator assembly to support the conductor wherever necessary.	Each	50.00	390.71	19535.59
9(b)	Connecting equipment to bus and/or another equipment with twin Moose conductor including measuring, cutting, clamping and also hoisting of suspension insulator assembly to support the conductor wherever necessary .	Each	12.00	605.03	7260.35

Sl.No	Description of Work	UOM	Qty	Unit Rate (Rs.)	Total (Rs.)
9(C)	Connecting equipment to bus and/or another equipment with twin Moose conductor including measuring, cutting, clamping and also hoisting of suspension insulator assembly to support the conductor wherever necessary .(During Shutdown)	Each	12.00	907.54	10890.53
8	Laying of earthmat including excavation of trenches, welding and fixing lugs, connecting to equipment and connecting lightening shield to earthmat and earthing of fence posts, drilling and connecting earth rods including connecting cast iron pipes as per Drg.No.SET(SS)1/99 with following sizes of MS Flats & GI flats INCLUDING Fabrication.			0.00	0.00
a	75X8 mm MS Flat	RM	4725.00	103.52	489121.13
b	100X16 mm MS Flat	RM	199.50	115.19	22979.71
c	75X8 GI Flat	RM	700.00	103.52	72462.39
d	100X16 mm GI Flat	RM	400.00	115.19	46074.60
9	Excavation of main earth pit, putting cast iron pipe with flange on one end (as per ISS 7181/86) of nominal dia 125mm and 2.75 meters long inside the pit including supply and fixing RCC collars 0.75 meter dia 50 mm thick and 0.60 metrs long side the pit, backfill the pit in the 25 mm size granules of BH coke for full depth of the pit with alternate layers of BH coke, Salt and earth of 300mm thick around the earth pipe of 150mm on all sides of the pipe including cost and conveyance of BH COKE, SALT, CLAMPS, C.I.PIPES AND RCC COLLARS, labour charges for all operational incidental items of work etc., complete	Each	18.00	16622.85	299211.28
10	Laying of control cables of all sizes(from 2 core, 2.5/4.0sqmm to 12 core 2.5/4.0sqmm both copper and alluminium) in cable trenches INCLUDING COST OF SUITABLE METALLIC CABLE GLANDS with rubber lining. Note: This includes runninng cables in control room where cables are run on cable racks in cable duct.	RM	15000.00	13.12	196750.13
11-a	Laying of Power Cables above 50 Sqmm.	RM	500.00	23.33	11663.44
12	Cable termination to the switch-gear, marshalling boxes/panel terminal blocks/control & relay panels, LTAC panel, including providing suitable ferrules and lugs as per specification in both (including cost of ferrules and lugs). Note: Rate to be quoted is for termination of one core of cable at both ends.			0.00	0.00
(i)	2.5 sq.mm copper	Each	1000.00	39.37	39371.48

Sl.No	Description of Work	UOM	Qty	Unit Rate (Rs.)	Total (Rs.)
(ii)	Above 50.0 sq.mm Power Cable	Each	100.00	167.67	16767.47
13	Erection of the following equipment at site including handling the material / equipment carefully at site including labour charges for all incidental and operational items of work.(Excluding cost of transport charges from dept stores to site).	Each		0.00	0.00
(a)	220 kV CB	Each	1.00	26099.12	26099.12
(c)	220 kv CT	Each	3.00	6341.81	19025.43
(e)	220 kv LA	Each	3.00	4101.04	12303.11
(h)	220 kv Isolator without E/S	Each	2.00	9324.65	18649.29
(i)	220 Kv Bus Port Type Insulator	Each	2.00	527.76	1055.51
14	Erection of Control/ Relay Panels, LTAC Panels, announciation panels etc., in the control room duly mounting them on channels and grounting them with foundation bolts EXCLUDING COST OF CHANNELS & FOUNDATION BOLTS	Each	5.00	3312.32	16561.60
15	Erection of marshalling kiosk.	Each	1.00	1113.82	1113.82
16	Making terminations, testing and commissioning of 33KV, 1cx400Sqmm, XLPE cable heat shrinkable cable jointing kits suitable for indoor breakers.	Each	24.00	7217.79	173226.85
17	Laying of 33KV,400Sqmm copper cable as per the technical specification from LV side of the PTR to 33KV Indoor Switchgear Modules .The cables should be layed through preformed trenches including providing supporting angles and cleats wherever necessary	RMt	2000.00	380.51	761024.55
18	Supply & Erection of Aluminium pipe regid bus (Approx.3Mtrs per Phase) including cost of clamps at LV side PTR for mounting on 33KV Solid core insualtors for each phase to connect the terminations with required hardware as per the site enginer instructions	Nos.	3.00	1072.55	3217.66
19	Erection of 33kV, AIS (AIR INSULATED SWITCHGEAR) Indoor switchgear panels along(Feder Incomers ,PTR LVs,Auxilary Tranformers ,Bus Sectionaliseres ,Bus PTs) with Bus bar, CTs,PTs etc.,	Nos.	8.00	1072.55	8580.43
20	Erection of marshalling box on the structures of equipment	Each	2.00	540.88	1081.77
21	Erection of Lighting Pillar Box in switch yard on foundation laid (Excluding cost of pillar box)	Each	1.00	1491.41	1491.41

Sl.No	Description of Work	UOM	Qty	Unit Rate (Rs.)	Total (Rs.)
22	Writing of names and other details on the equipment marshalling kiosk C&R panels etc.with superior quality white enamel paint including cost of brushes,paint and labour charges etc.	Each	50.00	112.26	5612.93
23	Painting of RYB Colours on structures equipment, isolators, LA's, etc with superior quality enamel paint including cost of brushes, cost of paint, labour charges etc. complete	set	30.00	85.80	2574.00
24	Supply and fixing of 105 lbs rail pole over transformer plinth including cost and conveyance of all materials ,labour charges for cutting and fixing chargrs with lead & lifts etc., complete	RM	24.00	867.44	20818.51
25	Supply & fixing of 15 lbs capacity CO2 portable Fire extinguishers (without trolly) of standard make with ISI certification like Fire flex / Sharathy industries complete with first filling horn and hose.	set	2.00	4826.25	9652.50
26	Supply & fixing of 50 lbs capacity CO2 portable Fire extinguishers (with trolly) of standard make with ISI certification like Fire flex / Sharathy industries complete with first filling horn and hose.	Each	2.00	19841.25	39682.50
27	Supply & fixing of 50 Kgs Capacity Trolley Mounted Dry Chemical power type fire extinguisher (Make with ISI Certification) with all accessoriesextinguishers (with trolly) of standard make with ISI certification like Fire flex / Sharathy industries complete with first filling horn and hose.	Nos.	2.00	15426.84	30853.68

Sl.No	Description of Work	UOM	Qty	Unit Rate (Rs.)	Total (Rs.)
28	Installation, testing & commissioning of SAS Includes networking HW&SW (BCUs to main LAN), third party licenses (oracle, anti-virus etc), Engineering, DB creation and custom development specific for each Substation, SCADA standard SW license, splicing of fibre optic cable, formation of SAS architecture, configuretion of IED's, Miscellaneous works etc.	LS	1.00	93333.04	93333.04
				Total:	**2,784,880.93**

Schedule-C (Civil Works)

Name of work: Construction of Civil works for Control Room, Bay Kiosks, RCC cable ducts, Switchyard foundations, fire protection walls and water supply arrangements for earth pits for the proposed augmentaton of Galiveedu PSS - 2.

Sl.No.	Quantity	Description	Rate	per	Amount
1	**370**	Earthwork excavation in all types of soils for control House (up to stone matrix)which can be excavated with pick axe and crow bars and do not require blasting in all conditions such as dry, wet and slushy etc. covering initial lead and lift etc and backfilling the foundations (after laying foundations) with excavated earth and disposal of balance earth away from the site with all leads & lifts etc complete as per the the directions of the Engineer in charge for the finished item of work. .	**203.00**	One Cum	75110.00
2	**40**	Excavation in Hard rock (requiring controlled blasting) for foundations and cable ducts etc, The rate includes labour charges, cost of blasting materials, tools and tackles, safety measures, disposal of unuseful excavted material at all leads and lifts, complete for finished item of work as per directions of the Engineer-in-charge	**850.00**	One Cum	34000.00
3	**30**	Laying of Cement Concrete (1:4:8) mix using 40mm size HBG metal for foundations including cost and conveyance of all materials at all leads and lifts, ramming, consolidating, curing etc,complete. for finished item of work as per directions of the Engineer-in-charge.	**4334.00**	One Cum	130020.00
4	**35**	Providing High Yield Strength Deformed (HYSD)/ Thermo Mechanically Treated (TMT) (Fe 415 grade as per IS 1786-1979) of TISCO/ SAIL/ VSP make, different diameters for RCC works , including labour charges for straightening, cutting, bending to required sizes and shapes, placing in position with cover blocks of approved materials and size and tying and lap-splicing with binding wire of 18 SWG, forming grills for reinforcement work as per approved designs and drawings, including cost and conveyance of steel bars, including all wastages such as overlaps, couplings, chairs, spacer bars including cost and conveyance of binding wire, cover blocks and all incidental, operational, labour charges such as cutting, bending, placing in position, tying including sales and other taxes on all materials etc., complete for finished item of work in all floors.(APSS No.126)	**85911.00**	One MT	3006885.00
5	**5**	Supply and fixing in position M.S. grills/Angles/gates of required size of approved design and quality. (for, gates, windows, hand railing in front of portico, retaining walls ,) and painting with two coats of synthetic enamel paint of approved quality, make, colour and shade over one coat of red oxide, complete as per the directions of the Engineer in charge for the finished item of work.	**64092.00**	One MT	320460.00

6		Supply and placing of the RCC Design Mix M30 Concrete corresponding to IS 456 using WEIGH BATCHER / MIXER with 20mm size graded machine crushed hard granite metal (coarse aggregate) from approved quarry including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water etc., to site and including Seigniorage charges, sales & other taxes on all materials including all operational, incidental and labour charges such as weigh batching, machine mixing, laying concrete, curing etc.,complete but excluding cost of steel and its fabrication charges for finished item of work (APSS No. 402)with minimum cement content as per IS code (not less than 415 KG - as per approved Mix Design) from standard suppliers approved by the department including pumping, centering, shuttering, laying concrete, vibrating, curing etc. complete			
A	**40**	For Foundations	**8770.00**	One Cum	350800.00
B	**5**	For Pedestals	**9269.00**	One Cum	46345.00
C	**15**	For plinth beam	**10972.00**	One Cum	164580.00
D	**20**	for Columns	**11364.00**	One Cum	227280.00
E	**15**	for Columns - First floor	**11821.00**	One Cum	177315.00
F	**5**	For Lintels	**11554.00**	One Cum	57770.00
G	**10**	For Lintels - First Floor	**11941.00**	One Cum	119410.00
H	**5**	for Sunshades 600 mm wide (75 mm avg thk)	**1032.00**	One Sqm	5160.00
I	**40**	for Sunshades 600 mm wide (75 mm avg thk) -First floor	**1076.00**	One Sqm	43040.00
J	**25**	for Beams	**10858.00**	One Cum	271450.00
K	**20**	For Beams - First floor	**11271.00**	One Cum	225420.00
L	**50**	For roof slab 150 mm thk & Staircase slab	**10515.00**	One Cum	525750.00
M	**50**	For roof slab 150 mm thk & Staircase slab - First floor	**10916.00**	One Cum	545800.00
7	**130**	Construction of RR Masonry in CM (1:6) using hard rough granite stone and bond stones (0.16 cum) including cost and conveyance of all matreials., labour charges, water lead , Curing, all leads and lifts etc., complete for finished item of work as per directions of the Engineer-in-charge.	**3777.00**	One Cum	491010.00
8	**100**	Brick Masonry in CM (1:6) with 2nd class Bricks traditional size 23 x 11 x 7 cms of approved quality, including cost & conveyance of all materials, labour charges, scaffolding leads, lifts and curing complete as per the directions of the Engineer in charge for the finished item of work . - for Ground Floor upto an Height of 4.20 M	**6308.00**	One Cum	630800.00
9	**5**	Plain Cement concrete - Nominal Mix (1:3:6) with 12 to 20mm HBG metal for encasing/embedding the structural steel supportng 'Y' angles with necessary form work including cost and conveyance of all materials, labour charges, water charges, tools and tackles, all leads & lifts etc., complete for finished item of work as per directions of the Engineer-in-charge. (IS-456)	**5595.00**	One Cum	27975.00

10	**10**	Supply, fabrication and erection of Anodized Aluminium Double leaf door (partly glazed & partly panelled) using sections of size 101.60mmx44.75mmx2.40mm @ 1.834 Kg/m (Jindal Sec 14021) for frame and 47.62mmx44.45mmx2.02mm @ 1.052 Kg/m (Jindal Sec 19569) for shutter verticals, 47.62mmx44.45mmx1.95mm @ 0.974 Kg/m (Jindal Sec 19571) for shutter top, 114.30mmx44.45mmx2.15mm @ 1.824 Kg/m (Jindal Sec 19574) for shutter bottom, 83.50mmx44.45mmx2.40 mm @ 1.679 Kg/m (Jindal Sec 19525) for shutter middle and fitted with 5mm thick plain glass on upper half and 12mm thick both sides prelaminated cement particle board for lower half of the shutters including cost & conveyance of all materials, 1st quality Double action brass cover plate and cast brass body Floor spings (for inner & outer rotation), central pivots, rubber beading, heavy duty Mortice lock 6/7 levers with PC/CP handles, labour charges & other incidental charges complete as per the drawing and as per the directions of Engineer-in-charge for finished item of work.	**6805.00**	One Sqm	68050.00
11	**5**	Supply and fixing Aluminium Anodised Doors - Single Shutter (partly glazed & partly panneled)as per approved drawing with aluminium anodised sections of Jindal sections and outer frame top horizontals & both verticals of 14021 of size 101.6 x 44.75 x 2.40 mm, Shutter frame top of size 44.45 mm x 47.62 mm x 1.95 section 19571 , bottom of size 44.45 mm x 114.30 mm x 2.15 section 19574 and verticals of 19569 of size 44.45 mm x 47.62 mm x 2.02 and Middle lock rail of 19525 of size 83.50 x 44.45 x 2.40 mm and fitted with 12mm thick both sides prelaminated cement particle board for shutter including supply and fixing aluminium handles of 125 mm for each shutter, Providing and fixing Cast Iron Body Bottle Type Hydraulic Door Closer (IS: 3564) with double speed adjustment assembly, aluminum door stopper and all labour charges for fixing the fixtures with required no.of screws, bolts and nuts and including labour charges for fixing the frame in position, fixing shutter to frame etc. completed for finished item of work	**5696.00**	One Sqm	28480.00
12	**5**	Supply and fixing Aluminium Anodised Doors - Single Shutter (Panneled) as per approved drawing with aluminium anodised sections of Jindal sections and outer frame top horizontals & both verticals of 14021 of size 101.6 x 44.75 x 2.40 mm, Shutter frame top of size 44.45 mm x 47.62 mm x 1.95 section 19571 , bottom of size 44.45 mm x 114.30 mm x 2.15 section 19574 and verticals of 19569 of size 44.45 mm x 47.62 mm x 2.02 and Middle lock rail of 19525 of size 83.50 x 44.45 x 2.40 mm and fitted with 12mm thick both sides prelaminated cement particle board for shutter including supply and fixing aluminium handles of 100 mm for each shutter, Providing and fixing Cast Iron Body Bottle Type Hydraulic Door Closer (IS: 3564) with double speed adjustment door closure assembly and all labour charges for fixing the fixtures with required no.of screws, bolts and nuts and including labour charges for fixing the frame in position, fixing shutter to frame etc. completed for finished item of work	**5928.00**	One Sqm	29640.00

13	**50**	Supply and fixing Aluminium Anodised Two Track Sliding Windows as per approved drawing with aluminium anodised sections of Series B Jindal sections and outer frame top horizontals & both verticals of 20829 of size 61.85 x 31.75 mm x 1.50mm thick and bottom horizontal - two track frame of 20830 of size 61.85 x 31.75 mm x 1.50mm thick, Shutter frame top, bottom and verticals of 20736 of size 40 mm x 18 mm x 1.55 mm thick and Weather interlocking frame of 20737 of size 40 x 18 x 1.45 mm thick with TINTED COLOURED GLASS 5 mm thick fixed including supply and fixing aluminium handles of 100 mm for each shutter, nylon rollers assembly and all labour charges for fixing the fixtures with required no.of screws, bolts and nuts and including labour charges for fixing the frame in position, fixing shutter to frame etc. completed for finished item of work	**3289.00**	One Sqm	164450.00
14	**5**	Supply, fabrication and erection of Anodized Aluminium glazed ventilator using section of size 81.25mmx38.10mmx1.75mm @ 1.093 Kg/m (Jindal Sec 14071) for frame and 'U' seciton of size 12.50mmx12.50mmx1.00mm @ 0.133 Kg/m (Jindal Sec 17533) for louvers and inserting 5mm thick plain glass panes including cost & conveyance of all materials, labour charges and other incidental charges complete as per the drawing and as per the directions of Engineer-in-charge for finished item of work.	**3819.00**	One Sqm	19095.00
15	**90**	Providing impervious coat to exposed RCC roof slab surface with CM(1:3), 20mm thick with 1kg of water proof compound per bag of cement laid over roof when it is green including cost & conveyance charges of all materials and including all operational, incidental and labour charges for mixing mortar, laying, rendering smooth and thread lining, curing, rounding off junctions of wall and slab etc,, complete for finished item of work - GROUND FLOOR	**443.00**	One Sqm	39870.00
16	**200**	Plastering with CM (1:3), 12 mm thick ceiling and projections of beams at all heights including cost & conveyance of all materials, scaffloding, labour charges, leads, lifts and curing complete as per the directions of the Engineer in charge for the finished item of work. Ground Floor upto 4.2m height	**330.00**	One Sqm	66000.00
17	**460**	Plastering with CM 2 coats, 20 mm thick,base coat in CM (1:6), 16mm thick and top coat in CM (1:4), 4mm thick with Dubara sponze finishing.on the uneven surfaces of wall including cost & conveyance of all materials, labour charges, leads, lifts, scaffolding and curing complete as per the directions of the Engineer in charge for the finished item of work. Ground Floor upto 4.2m height	**420.00**	One Sqm	193200.00
18	**475**	Plastering with CM (1:5), 12 mm thick to the even wall surfaces including cost & conveyance of all materials, labour charges, leads, lifts , scaffolding and curing complete as per the directions of the Engineer in charge for the finished item of work.Ground Floor upto 4.2m height	**307.00**	One Sqm	145825.00

19	**60**	Flooring & Dadoing with Ceramic floor tiles of size 300 x 300 mm and thickness between 7-8 mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs, set over base coat of cement mortar (1:8), 12 mm thick over CC bed already laid or RCC roof slab, including neat cement slurry of honey like consistency spread @ 3.3.kgs per sqm & jointed neatly with white cement paste to full depth mixed with pigment of matching shade, including cost of all materials like cement, sand water and tiles etc., complete, including seigniorage charges, etc., complete as per the directions of the Engineer in charge for the finished item of work.	**861.00**	One Sqm	51660.00
20	**1200**	Painting to internal new walls with 2 coats of plastic emulsion interior type of approved brand (Asian, Berger, Nippon) and shade over a base coat of appropriate primer of approved brand,making 3 coats in all to give an even shade after thourughly brushing the surface to remove all dirt and remains of loose powdered materials, including cost and conveyance of all materials to work site and all operational, incidental, labour charges etc.complete for finished item of work as per SS 911 for internal walls	**141.00**	One Sqm	169200.00
21	**1400**	Painting to External new walls with 2 coats of acrylic emulsion paint exterior grade with silicon additives having VOC (Volatile Organic Compound) content less than 50 grams/ liter. of approved brand (Asian, Berger, Nippon) and shade over a base coat of appropriate primer of grade I quality approved brand,making 3 coats in all to give an even shade after thourughly brushing the surface to remove all dirt and remains of loose powdered materials, including cost and conveyance of all materials to work site and all operational, incidental, labour charges etc.complete for finished item of work as per SS 912 for External walls	**178.00**	One Sqm	249200.00
22	**30**	Construction of cable duct in the bay kiosk with BM in CM (1:6) ,as per the drawing including sand filling and cost & conveyance of all materials, labour charges, leads, lifts and curing etc, complete as per the directions of the Engineer in charge for the finished item of work	**4375.00**	One Rm	131250.00
23	**250**	Providing and fixing of false ceiling in true horizontal level 600 mm x 600 mm, 15 mm thick Mineral Fibre sheet 600 x 600 of fissured-ANF (Board / Tegular) Edge tiles with a Humidity Resistance of 90% RH, Average NRC 0.50, Light Reflectance >80%, Thermal Conductivity λ = 0.052 to 0.057 w/mk, Fire Performance Class 0/Class 1 using hot dipped Galvanised Steel section exposed surface with pre-coated capping, main Tee of size 24 x 32 mm at every 1200 mm c/c maximum and rotary stiched cross tee of size 24 x 27 mm at evry 600 mm c/c and sub-cross tee of size 24 mm x 25 mm at 1200 mm c/c and wall angle of size 19 x 19 mm fixed to periphery of the wall and the above grid is suspended at every 1200 mm c/c in both directions using 2.0 mm thick pre-straightened GI Wire laying fine fissured butt edge ceiling tiles of 15 mm thick mineral fiber Board including Cost &conveyance of all materials and labour charges such as cutting , fixing of standing of frame work exposing roof making complete as per the directions of the Engineer in charge for the finished item of work. (Recommended brands: armstrong, Insula etc)	**1221.00**	One Sqm	305250.00

24	**125**	Supply and fixing of Ramco hylux wall panelling using 8mm Ramco hylux with frame work made of Aluminium sections of size 50.8mmx50.8mmx1.6mm thick @ 0.890Kg/m fixed at bottom & ceiling of the brick wall covered with Ramco hylux wall panelling. 50mm thick thermocole is fixed in the cavity of wall panelling and Ramco hylux calcium silicate board 8mm is to be fixed using jointing compound and glass fibre tape . The rate inclusive of cost and conveyance of all materials to site and inclusive of two coats synthetic enamel painting over one coat primer, all other materials, labour and incidental charges complete as per the directions of engineer in Charge for finished item of work.(For Bay kiosk)	**1756.00**	One Sqm	219500.00
25	**80**	20 mm thick plain cement mortar bands in cement mortar 1 : 4 (1cement : 4 sand) upto 300 mm in width including cost & conveyance of all materials, labour charges, leads, lifts, scaffolding and curing complete as per the directions of the Engineer in charge for the finished item of work.	**66.00**	One RM	5280.00
26	**200**	Supply and planting of plants like flowering plants fruit bearing plants etc., including excavation of pits of size 0.6x0.6x0.6m., filling the pit with a mixture of red earth, sand, manure in the ratio of 2:1:1 including cost and conveyance of all materials with all leads and lifts including watering the plants for a period of six months, complete as per the directions of the Engineer in charge for the finished item of work.	**375.00**	One No	75000.00
		WATER SUPPLY & SANITARY WORKS			
27	**2**	Supplying & Fixing 580mmx440mm Orissa Pan white glazed W.C 1st quality ISI marked conforming to IS:2556-Part-3-1981 with "P" or "S" trap Hindware/ Parryware/ Neycer - ISI Mark and 10 Liters capacity Single Flush PVC low level Cistern parry ware, slim line with internal components & short bendand complete as per the directions of the Engineer in charge for the finished item of work.	**3159.00**	One No	6318.00
28	**2**	Supplying & Fixing 550x400 mm- single C.P. Pillar cock Indian make Flat Back Wash Hand Basin (HSW/Parryware/ Neycer) 1st quality conforming to IS:2556-Part-4:1972 with waste fittings like rubber plug, chain, 32 mm nominal size C.P. Fitting with parallel pipe thread conforming to IS:2963-1979 and fitted with 15 mm nominal bore Chromium Plated Pillar Tap of 1st quality Indian make 300 grams Seiko/ Esso or equivalent complete with standard CI brackets including	**1865.00**	One No	3730.00
29	**2**	Supplying and fixing Pedestal for wash hand basin (HSW/Parry/Earthenware) make including cost of all fixtures, labour for fixing as per the directions of the Engineer in charge for the finished item of work.	**1291.00**	One No	2582.00
30	**2**	Supplying and fixing white glazed flat back Bowl urinal basin (Indian type) of size 440x265x315mm of HSW/Parry/Neycer make including all fixtures, labour for fixing as per the directions of the Engineer in charge for the finished item of	**965.00**	One No	1930.00

31	**2**	Supplying and fixing 19.05mm dia and 609.6mm long C.P. Towel rod of Ist quality including cost of brackets as per the directions of the Engineer in charge for the finished item of work.	**406.00**	One No	812.00
32	**2**	Supplying and fixing NP Soap dish heavy type with NP Screws including cost & conveyance of materials and labour for fixing complete as per the directions of the Engineer in charge for the finished item of work.	**248.00**	One No	496.00
33	**2**	Supplying and fixing TV Shape mirror with PVC frame size 609.6x457.2mm including cost & conveyance of materials and labour for fixing complete as per the directions of the Engineer in charge for the finished item of work.	**539.00**	One No	1078.00
34		Providing and fixing in position at all levels of the buildings G.M. Gate(GM peet) Valve (Tata/Zenith/Zoloto / Leader / Approved makes)as per IS-778 class- 1, Indian make heavy type for water services with hand wheel at all elevations for following sizes including jointing complete as per the directions of the Engineer in charge for the finished item of work.			
a	**5**	32 mm dia Nominal Bore	**1899.00**	One	9495.00
b	**5**	25mm dia Nominal Bore	**1251.00**	One No	6255.00
35	**5**	Supplying and fixing long body C.P. Taps including cost and conveyance, labour charges complete as per the directions of the Engineer in charge for the finished item of work.	**341.00**	One No	1705.00
36	**10**	Providing and fixing 101.6 mm dia PVC Nahani Trap/Floor trap of standard make including making connection to PVC pipes/waste water lines with cement concrete base for embedding traps in position, finishing up to floor level with water proof cement plaster with grating at top complete as per the directions of the Engineer in charge for the finished item of work.	**269.00**	One No	2690.00
37	**55**	Providing and fixing in position at all levels of the building under floors and against walls 110mm dia (4kg/cm2) PVC pipes of prince / sudhakar or any ISI brand make with specials such as junctions, with or without access doors as required and fixing cowls at top wherever necessary including excavation and refilling wherever required,, testing etc. complete as per the directions of the Engineer in charge for the finished item of work.	**514.00**	One RM	28270.00
38	**5**	Supplying and fixing 110mm dia PVC bends including cost and conveyance, labour for fixing complete as per the directions of the Engineer in charge for the finished item of work.	**89.00**	One No	445.00
39	**5**	Supplying and fixing of 12.7 mm NP stop cock Indian make heavy duty Seiko/ Senior/ Nice/ Senior/ Nice or equivalentincluding cost and conveyance, labour for fixing complete as per the directions of the Engineer in charge for the finished item of work.	**483.00**	One No	2415.00
40	**2**	Construction of 457.2mmx457.2mm brick masonry in CM (1:6) man hole upto 914.4 mm depth and fitted with light weight 457.2 mmX457.2 mm CI frame and cover of 20 Kg weight including cost and conveyance of all materials, labour charges complete as per the directions of the Engineer in charge for the finished item of work.	**3855.00**	One No	7710.00

41	1	Supply and erection of sintex or equivalent make polyethylene water storage tank of 1000 lts capacity double layer conforming to ISI 12701/96 with lid including cost and conveyance of all materials, all fixtures, all leads and lifts complete as per the directions of the Engineer in charge for the finished item of work.	**8522.00**	One No	8522.00
42	1	Construction of 2.0x0.90x2.30m (Internal dimensions) Septic tank as per the approved drawing and specifications conforming to IS 2470 and soak pit of size 2.5 m dia and 2.5 m depth including inlet and outlet pipes, ventilating pipe and cowl, RCC slab etc, cost and conveyance of all materials, labour charges complete as per the directions of the Engineer in charge for the finished item of work.	**80722.00**	One No	80722.00
		INTERNAL ELECTRIFICATION FOR CONTROL HOUSE			
43	**150**	Wiring with 2 runs of 22/0.30(1.5 Sqmm) Fire Retardant (FR) P.V.C. insulated flexible copper cable (ISI MARK) Finolex/ RR Kabel make in existing pipe with 6A switch(Anchor make), Ceiling rose (Anchor make) and 3mm thick hylam sheet covering to switch control box including all labour charges etc., complete for light, bell, fan and exhaust fan points in Non-Residential Buildings	**635.00**	One point	95250.00
44	**20**	Supply and fixing of 1200mm(48") 230V, AC, 50Hz ceiling fan 5 star rated with 3 blades and double ball bearings of standard make (CromptonGreaves/Bajaj/(High speed/ Ultima models) with suitable down rod covered with flexible pipe, Stepped type heavy duty electronic regulator (Anchor make) with all standard accessories including cost of all fittings and fixtures, labour for fixing at all positions of building giving electrical connections with necessary tools complete as directed by the Engineer in charge for finished item of work.	**4359.00**	One No	87180.00
45	**25**	Supply and fixing of fluorescent tube light fixtures of twin tube 2X36/ 40 Box type tube light luminaire powder coated CRCA sheet steel housing with 2 Nos Electronic Ballast Chokes and all standard accessoriesof makes Wipro / G.E. / Phillips / Crompton / Bajaj/ Havells/ HPL/ Halonix and 2 Nos 36/40W tube (Phillips / Crompton / Bajaj / Surya / Style Lamp / Capart make) on Teak Wood Block on ceiling or wall with all accessories including giving connections, all labour charges and cost of materials complete as directed by the Engineer in charge for the finished item of work.	**1533.00**	One No	38325.00
46	**35**	Supply and fixing of fluorescent tube light fixtures of single tube 1 X 36/40Watts Box type tube light luminaire powder coated CRCA sheet steel housing with Electronic Ballast Chokes and all standard accessoriesof makes Wipro / G.E. / Phillips / Crompton / Bajaj and 1 No. 36/40 W tube (Wipro/G.E./Phillips/ Crompton / Bajaj make) on Teak Wood Block on ceiling or wall with all accessories including giving connections, all labour charges and cost of materials complete as directed by the Engineer in charge for the finished item of work.	**1050.00**	One No	36750.00
47	**10**	Supply and fixing of Well Glass Vapour proof and Resistant fitting with 60 Watts PC bulb (Philips, crompton , bajaj make)on walls in the battery room including giving connections, all labour charges and cost of materials complete as directed by the Engineer in charge for the finished item of work.	**263.00**	One No	2630.00

48	**5**	Supply and fixing decorative portico type light fitting with all accessories to the ceiling of veranda including giving connections, all labour charges and cost of materials complete as directed by the Engineer in charge for the finished item of work.	**376.00**	One No	1880.00
49	**45**	Supply and fixing of HID / batten holder / slanting holder with 60W incandesent bulb (Wipro/G.E./Phillips) in lieu of ceiling rose of light point complete with all connections and all labour charges with 40W Fluorescent bulb (Wipro/G.E./Phillips) (for new installation).	**142.00**	One No	6390.00
50	**10**	Supply and fixing Bajaj 150 Watts S.V. Lamp fitting (Surya/Havells) comprises of pressure die cast Alluminium housing with IP 65 protection and capacitor, ignitor with pot optics including 150 W SV lamp (Crompton/Bajaj/Surya/Havells) complete with fixing SV luminaire on wall with 1m, 40mm dia GI pipe bracket, anti-tilling MS flat, 2.5 Sqmm flexible copper cable including giving connections, all labour charges and cost of materials complete as directed by the Engineer in charge for the finished item of work at all levels of building.	**6922.00**	One No	69220.00
51	**30**	Supply and fixing of 16A 3pin / 6A 3pin plug socket (Anchor make) with indicator lamp and 16Amps fuse unit and 16 Amps Flush type switch control (5 in one) on 3mm thk Hylam sheet covered T.W board including earth connection and all labour charges, complete on wall.	**337.00**	One No	10110.00
52	**25**	Supply and fixing of 6A 3 pin wall plug socket (Anchor make) with 6A switch control (Anchor make) on a common switch board with earth continuity including wire leads, earth connections along with all labour charges etc., complete as per the directions of the Engineer in charge at site.	**139.00**	One No	3475.00
53	**425**	Supply and Run of 2 of 56/0.30 (4.0Sqmm) FR PVC insulated flexible Copper Cable (Finolex/L&T make) in existing pipe including giving connections, all labour charges and cost of materials complete as directed by the Engineer in charge for the finished item of work at all levels of building for Mains from Distribution board to Lighting point Board.	**129.00**	One RM	54825.00
54	**15**	Supply and fixing of 4 Way SPN DB with IP 30 Protection as per IS:13032 and suitable for 4Nos S.P out goings and for 1 No Incommer etc complete of makes Legrand / Schneider. make) with IP-20 protection suitable for single phase ELCB/RCCB/DP Isolator (Legrand / Schneider) as incomer and 10KA SP MCBs (Standard/Havells) as out-going including internal connection and labour charges and cost of materials complete as directed by the Engineer in charge for the finished item of work at all levels of building for surface/flush mounting.	**3579.00**	One No	53685.00
55	**80**	Supply and Run 4 of 84/0.30 (6.0Sqmm) FR PVC insulated flexible Copper cable (Finolex/L&T make) in existing pipe for run of Mains from AC panel to 32Amps Main switch as per colour code of wires including giving connections and labour charges and cost of materials complete as directed by the Engineer in charge for the finished item of work at all levels of building.	**361.00**	One RM	28880.00

56	**225**	Run 2 of 36/0.30 (2.5 Sqmm) FR PVC insulated flexible Copper Cable (Finolex/L&T make) in existing pipe for Mains from Distribution board to 15Amps 3 pin Power Plug including giving connections and labour charges and cost of materials complete as directed by the Engineer in charge for the finished item of work at all levels of building.	**85.00**	One RM	19125.00
57	**5**	Supply and fixing in position 32A. Main Switch (Sputnik or equivalent make) and including giving connections and labour charges and cost of materials complete as directed by the Engineer in charge for the finished item of work at all levels of building.	**1201.00**	One No	6005.00
58	**5**	Supply and fixing of 18" (450mm) sweep heavy duty exhaust fan (Crompton make) including cost and conveyance of all fixtures, fittings, labour for fixing in wall with necessary connections at all positions of building complete as directed by the Engineer in charge for the finished item of work at all levels of building.	**4876.00**	One No	24380.00
59	**10**	Supply of split AC unit of 1.5 TR 5 Star capable of delivering 18000 BTU/hr and above with operating on refrigerant R-32 / R-410A with COP not less than 3.6 w/w Makes: Daikin FTF50QRV16 or its equivalent model of Carrier / Blue Star. with high wall mounted indoor unit and outdoor condencing unit Hermetically sealed compressor suitable for operation on 230V, 50Hz, 1Phase AC supply capable of performing cooling dehumidifying air circulating and filtering with cooling and condensing units with 3.5 mts of copper piping, insulation kit and 4 mts of 3 core copper flexible chord , built-in stabilizer (Voltage range 160- 264 volts) and cordless remote control, including all labour charges and cost of materials complete as directed by the Engineer in charge for the finished item of work.	**63369.00**	One No	633690.00
60		Supply and Laying of P.V.C casing and caping (Diamond / Durga make)(ISI MARK) with double locking arrangments with groover trunking of size not below 12.5mm height 19/20mm size with all accessories, duly sealed at points and erected on Wall / Ceiling including cost of all materials and labour charges complete.			0.00
a	**120**	19mm / 20mm x 12.5 mm height	**51.00**	One RM	6120.00
b	**140**	25mm x 12.5mm height	**64.00**	One RM	8960.00
c	**200**	32mm x 12.5 mm height	**70.00**	One RM	14000.00
61	**5**	Providing independent earthing by excavating a trench to a depth of 2.1m in all soils, as per size specified in the data, using 40mm dia 'B' class GI pipe of 2.5m length with necessary accessories with hume pipe ring duly providing staggered holes including filling with equal proportion of salt and charcoal in layers and including giving connections and labour charges and cost of materials complete for small quarters as directed by the Engineer in charge for the finished item of work at all levels of building.	**4207.00**	One No	21035.00

		Switch Yard Foundations			
62	**1300**	Earthwork excavation in all types of soils for control House (up to stone matrix)which can be excavated with pick axe and crow bars and do not require blasting in all conditions such as dry, wet and slushy etc. covering initial lead and lift etc and backfilling the foundations (after laying foundations) with excavated earth and disposal of balance earth away from the site with all leads & lifts etc complete as per the the directions of the Engineer in charge for the finished item of work. .	**203.00**	One cum	263900.00
63	**680**	Hard rock (requiring controlled blasting) The rate includes labour charges, cost of blasting materials, tools and tackles, safety measures, disposal of unuseful excavted material at all leads and lifts, complete for finished item of work as per directions of the Engineer-in-charge	**850.00**	One cum	578000.00
64	**160**	Providing sand cushion for foundations and basement in layers not exceeding 15 Cm thick, including cost & conveyance of all materials, labour charges, leads, lifts , watering and consolidating to required density complete as per the directions of the Engineer in charge for the finished item of work(APSS No. 309&310)	**1309.00**	One cum	209440.00
65	**190**	Laying of Cement Concrete (1:4:8) mix using 40mm size HBG metal for foundations including cost and conveyance of all materials at all leads and lifts, ramming, consolidating, curing etc,complete. for finished item of work as per directions of the Engineer-in-charge.	**4334.00**	One cum	823460.00
66	**20**	Supplying, fitting and placing HYSD/TMT bar reinforcement (TISCO/ SAIL/ VSP make) in foundation complete as per drawings and technical specifications for Bars below 36 mm dia including over laps and wastage, where they are not	**76818.00**	One MT	1536360.00
67		RCC M- 20 Nominal mix (Cement 400 kgs) using 20mm size graded machine crushed hard granite metal (coarse aggregate) from approved quarry including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water etc., to site and including Seigniorage charges, sales & other taxes on all materials			
a	**500**	Switch yard Foundations and fire protection wall , Vertical wall upto Ground level , Raft of RCC cable duct	**9033.00**	One Cum	4516500.00
b	**20**	Vertical wall upto 3.66m height	**11590.00**	One Cum	231800.00
c	**10**	Vertical wall above 3.66m height	**15244.00**	One Cum	152440.00
68	**140**	Plastering with CM (1:3), 12 mm thick and finishing smooth to the required slope and painting two coats of Janatha Cem including cost & conveyance of all materials, labour charges, leads, lifts and curing including cost of Janatha Cem paint two coats, complete as per the directions of the Engineer in charge for the finished item of work.	**344.00**	One Cum	48160.00
69	**530**	Supply and spreading of crusher dust in the switch yard(100mm thick) area including Suitable antiweed treatment after completion of final levelling and grading including disposal of surplus earth and filling within switch yard areaincludind cost of all materials, all leads and lifts, labour charges complete as per the directions of the Engineer in charge for the finished item of work..	**1339.00**	One Cum	709670.00

70	**8000**	Supply and laying of 180 GSM LDPE sheet of approved make on top of the roof slab and roof beams before placing of reinforcment steel including cutting and jointing the sheet properly , laying the sheet neatly without folds , placing and positioning the sheet with Fevicol Tape and Binding wire with overlapping of minimum 500mm at joinintgs to avoid the cement slurry leakage from concrete and removing of the sheet during de-centring , including cost & conveyance of all materials, all leads & lifts , labour charges for laying and removing complete as per the directions of the Engineer in charge for the finished item of work.	**32.00**	One Sqm	256000.00
71	**750**	Supply and Spreading of 20mm size Hard Broken Granite metal in switch yard (100mm thick) including providing suitable PCC guage block of size 100x100x100mm at 2m x2m intervals , cost & conveyance of all materials, labour charges, leads, lifts complete as per the directions of the Engineer in charge for the finished item of work	**2397.00**	One cum	1797750.00
72	**430**	Construction of cable duct in the switch yard as per drawing no.SE/T(SS)/1/99 including sand filling and cost & conveyance of all materials, labour charges, leads, lifts and curing etc, complete as per the directions of the Engineer in charge for the finished item of work	**3744.00**	One RM	1609920.00
73	**20**	Construction of cable duct in the switch yard for Road Crossing by providing 2 Nos.300mm dia RCC Hume pipe (plain ended pipe)& collars required confirming to BIS 458/2003 NP3 class as per drawing including cost & conveyance of all materials, labour charges, leads, lifts and curing etc, complete as per the directions of the Engineer in charge for the finished item of work .	**3837.00**	One RM	76740.00
74		Supplying and fixing G.I. pipes Medium Grade as per IS 1239 of Tata/Zenith make for water supply line to toilets including cost and conveyance of pipe, G.I. specials such as elbows, Tees concealing same in walls and floors by cutting 25/ 20/ 15mm dia to be included grooves, packing, finishing after laying pipe in position as per the directions of the Engineer in charge for the finished item of work.			
a	**60**	15mm dia nominal bore	**214.00**	One RM	12840.00
75		Providing and fixing in position at all levels of the buildings G.M. Gate(GM peet) Valve (Tata/Zenith make)as per IS-778 class- 1, Indian make heavy type for water services with hand wheel at all elevations for following sizes including jointing complete as per the directions of the Engineer in charge for the finished item of work.			
a	**5**	25mm dia Nominal Bore	**1251.00**	One No	6255.00
76	**50**	Supply and fixing of 12.5mm/15mm dia N.P bib tap indian make 300 grams weight Seiko or equivalent make including cost & conveyance of all materials, labour charges, leads, lifts complete as per the directions of the Engineer in charge for the finished item of work .	**254.00**	One No	12700.00
		SUB- TOTAL			**23,666,355.00**

Schedule-D (Project Insurance)			
S.No.	**Description**	**Total Amount (excluding taxes)**	**Project Insurance@0.5% (Rs.)**
1	Supply of material for PSS-2, Galiveedu	28,216,098.73	141,080.49
2	Erection of equipment for PSS-2, Galiveedu	2,784,880.93	13,924.40
3	Civil portion for PSS-2, Galiveedu	23,666,355.00	118,331.78
	Total:		**273,336.67**